Self Diagnosis Supported model

SERVICE MANUAL

FE-1A CHASSIS

MODEL	COMMANDER	DEST	CHASSIS NO.	MODEL	COMMANDER	DEST	CHASSIS NO.
KV-21FX20A	RM-887	Italian	SCC-Q32D-A	KV-21FX20E	RM-887	Spanish	SCC-Q34D-A
KV-21FX20B	RM-887	French	SCC-Q33D-A	KV-21FX20K	RM-887	OIRT	SCC-Q36E-A
KV-21FX20D	RM-887	AEP	SCC-Q31D-A	KV-21FX20R	RM-887	OIRT	SCC-Q36F-A

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TRINITRON ® COLOR TV

SONY ®

ITEM MODEL	Television System	Stereo System	Channel Coverage	Color System
Italian	B/G/H	GERMAN Stereo	ITALIA VHF : A-H2 (C) UHF : 21-69 PAL B/G/H VHF : E2-E12 UHF : E21-E69 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10	PAL, SECAM NTSC4.43, NTSC3.58 (VIDEO IN)
French	B/G/H, D/K, L, I	GERMAN/NICAM Stereo	L VHF : F02-F10 UHF : F21-F60 CABLE : B-Q B/G/H VHF : E2-E12 UHF : E21-E69 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF : A-H2 (C) UHF : 21-69 I UHF : B21-B69	PAL, SECAM NTSC4.43, NTSC3.58 (VIDEO IN)
AEP	B/G/H	GERMAN Stereo	PAL B/G/H VHF : E2-E12 UHF : E21-E69 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF : A-H2 (C) UHF : 21-69	PAL, SECAM NTSC4.43, NTSC3.58 (VIDEO IN)
Spanish	B/G/H	GERMAN/NICAM Stereo	PAL B/G VHF : E2-E12 UHF : E21-E69 CABLE TV (1) : S1-S41 CABLE TV (2) : S01-S05, M1-M10, U1-U10 ITALIA VHF : A-H2 (C) UHF : 21-69	PAL, SECAM NTSC4.43, NTSC3.58 (VIDEO IN)
OIRT	B/G/H, D/K	KV-21FX20K GERMAN/NICAM Stereo KV-21FX20R GERMAN Stereo	B/G/H VHF : E2-E12 UHF : E21-E69 CABLE TV (1) : S1-S41 D/K VHF : R01-R12 UHF : R21-R69	PAL, SECAM NTSC4.43, NTSC3.58 (VIDEO IN)

MODEL	21FX20A	21FX20B	21FX20D	21FX20E	21FX20K	21FX20R
Power Consumption	80W	80W	80W	80W	80W	80W

[PICTURE TUBE] FD Trinitron
Approx. 55cm (21 inches)
(Approx. 51cm picture measured diagonally)
110 degree deflection

Input/Output Terminals

[REAR]

1/ 21-pin Euro connector (CENELEC standard).
- Inputs for Audio and Video signals.
- Inputs for RGB.
- Outputs of TV Video and Audio signals.

2/S 21-pin Euro connector.
- inputs for Audio and Video signals.
- inputs for S Video.
- outputs for Audio and Video signals (selectable).

Phono Jack
- Outputs for Audio Signals

[FRONT]

3 Video input - phono jack

3 Audio inputs - phono jacks

Headphone jacks : stereo minijack

Sound output	2 x 7W (RMS)
Power requirements	220 - 240V
Dimensions	Approx 545x446x485mm (w/h/d)
Weight	Approx 26.5kg
Supplied accessories	RM-887 Remote Commander (1) IEC designated R6 battery (2)
Other features	NICAM*****, FASTEXT, TOPTEXT *****(KV-21FX20B/21FX20E/21FX20K only)

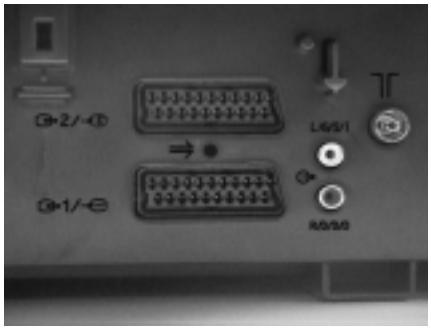
[RM-887]

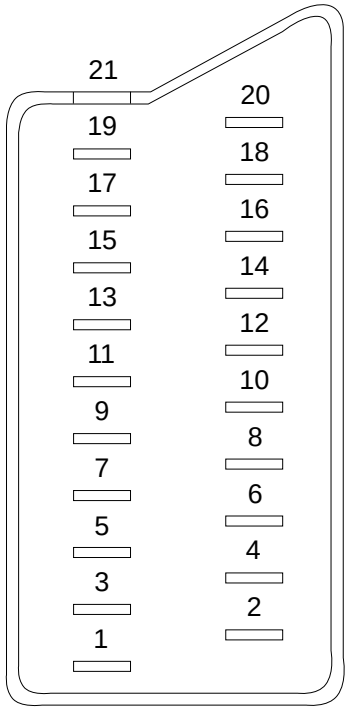
Remote control system	Infrared control
Power requirements	3V dc 2 batteries IEC designation R6 (size AA)
Dimensions	Approx 44x209x23mm (w/h/d)
Weight	Approx 89g (Not including battery)

Design and specifications are subject to change without notice.

Model Name / Item	KV-21FX20A	KV-21FX20B	KV-21FX20D	KV-21FX20E	KV-21FX20K	KV-21FX20R
Pal Comb	OFF	OFF	OFF	OFF	OFF	OFF
PIP	OFF	OFF	OFF	OFF	OFF	OFF
RGB Priority	OFF	ON	ON	ON	OFF	OFF
Woofer Box	OFF	OFF	OFF	OFF	OFF	OFF
Scart 1	ON	ON	ON	ON	ON	ON
Scart 2	ON	ON	ON	ON	ON	ON
Front in (3)	OFF	OFF	OFF	OFF	OFF	OFF
Scart 4	OFF	OFF	OFF	OFF	OFF	OFF
Projector	OFF	OFF	OFF	OFF	OFF	OFF
AKB in 16:9 mode	ON	ON	ON	ON	ON	ON
Norm B/G	ON	ON	ON	ON	ON	ON
Norm I	OFF	ON	OFF	OFF	OFF	OFF
Norm D/K	OFF	ON	OFF	OFF	ON	ON
Norm AUS	OFF	OFF	OFF	OFF	OFF	OFF
Norm L	OFF	ON	OFF	OFF	OFF	OFF
Norm SAT	OFF	OFF	OFF	OFF	OFF	OFF
Norm M	OFF	OFF	OFF	OFF	OFF	OFF
Teletext	ON	ON	ON	ON	ON	ON
Nicam Stereo	OFF	ON	OFF	ON	ON	OFF
Language Preset	Italian	French	German	Spanish	OIRT	OIRT

21 pin connector (1/ , 2 /)





Pin No	1	2	4	Signal	Signal level
1	○	○	○	Audio output B (right)	Standard level : 0.5V rms Output impedence : Less than 1kohm*
2	○	○	○	Audio output B (right)	Standard level : 0.5V rms Output impedence : More than 10kohm*
3	○	○	○	Audio output A (left)	Standard level : 0.5V rms Output impedence : Less than 1kohm*
4	○	○	○	Ground (audio)	
5	○	○	○	Ground (blue)	
6	○	○	○	Audio input A (left)	Standard level : 0.5V rms Output impedence : More than 10kohm*
7	○	●	●	Blue input	0.7 +/- 3dB, 75 ohms positive
8	○	○	○	Function select (AV control)	High state (9.5-12V) : Part mode Low state (0-2V) : TV mode Input impedence : More than 10K ohms Input capacitance : Less than 2nF
9	○	○	○	Ground (green)	
10	○	○	○	Open	
11	○	●	●	Green	Green signal : 0.7 +/- 3dB, 75 ohms, positive
12	○	○	○	Open	
13	○	○	○	Ground (red)	
14	○	○	○	Ground (blanking)	
15	○	–	–	Red input	0.7 +/- 3dB, 75 ohms, positive
	–	○	○	(S signal Chroma input)	0.3 +/- 3dB, 75 ohms, positive
16	○	●	●	Blanking input (Ys signal)	High state (1-3V) Low state (0-0.4V) Input impedence : 75 ohms
17	○	○	○	Ground (video output)	
18	○	○	○	Ground (video input)	
19	○	○	○	Video output	1V +/- 3dB, 75ohms, positive sync 0.3V (-3+10dB)
20	○	–	–	Video input	1V +/- 3dB, 75ohms, positive sync 0.3V (-3+10dB)
	–	○	○	Video input Y (S signal)	1V +/- 3dB, 75ohms, positive sync 0.3V (-3+10dB)
21	○	○	○	Common ground (plug, shield)	

○ Connected ● Not Connected (open) * at 20Hz - 20kHz

TABLE OF CONTENTS

Section	Title	Page
	FE-1A Self Diagnostic Software	6
1. GENERAL		
	Automatically tuning the TV Using the Remote Control	7
	Manually Tuning the TV	8
	Adjusting the Picture	9
	Adjusting the Sound	9
	Viewing Teletext	10
	Using Optional Equipment	10
	Troubleshooting	11
	Specifications	11
2. DISASSEMBLY		
2-1.	Rear Cover Removal	12
2-2.	Chassis Assy Removal	12
2-3.	Service Position	12
2-4.	S1 Board Removal	13
2-5.	Picture Tube Removal	14
2-6.	Removal and Replacement of the Main - Bracket bottom plates	15
3. SET-UP ADJUSTMENTS		
3-1.	Beam Landing	16
3-2.	Convergence	17
3-3.	Focus	19
3-4.	White Balance	19
4. CIRCUIT ADJUSTMENTS		
4-1.	Electrical Adjustments	20
4-2.	Test Mode 2	23
5. DIAGRAMS		
5-1.	Block Diagram	25
5-2.	Circuit Board Location	30
5-3.	Schematic Diagrams and Printed Wiring Boards	30
	* A Board	35
	* S1 Board	40
	* CVM Board	43
5-4.	Semiconductors	45
5-5.	IC Blocks	47
6. EXPLODED VIEWS		
6-1.	Chassis	48
6-2.	Picture Tube	49
7. ELECTRICAL PARTS LIST		50

CAUTION

SHORT CIRCUIT THE ANODE OF THE PICTURE TUBE AND THE ANODE CAP TO THE METAL CHASSIS, CRT SHIELD, OR THE CARBON PAINTED ON THE CRT, AFTER REMOVAL OF THE ANODE CAP

WARNING !!

AN ISOLATING TRANSFORMER SHOULD BE USED DURING ANY SERVICE WORK TO AVOID POSSIBLE SHOCK HAZARD DUE TO LIVE CHASSIS. THE CHASSIS OF THIS RECEIVER IS DIRECTLY CONNECTED TO THE POWER LINE.

SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARKED ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL FOR SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

ATTENTION

APRES AVOIR DECONNECTE LE CAP DE'LANODE, COURT-CIRCUITER L'ANODE DU TUBE CATHODIQUE ET CELUI DE L'ANODE DU CAP AU CHASSIS METALLIQUE DE L'APPAREIL, OU AU COUCHE DE CARBONE PEINTE SUR LE TUBE CATHODIQUE OU AU BLINDAGE DU TUBE CATHODIQUE.

ATTENTION !!

AFIN D'EVITER TOUT RISQUE D'ELECTROCUTION PROVENANT D'UN CHÁSSIS SOUS TENTION, UN TRANSFORMATEUR D'ISOLEMENT DOIT ETRE UTILISÈ LORS DE TOUT DÈPANNAGE. LE CHÁSSIS DE CE RÈCEPTEUR EST DIRECTMENT RACCORDÈ Á L'ALIMENTATION SECTEUR.

ATTENTION AUX COMPOSANTS RELATIFS Á LA SÈCURITÈ !!

LES COMPOSANTS IDENTIFIÈS PAR UNE TRAME ET PAR UNE MARQUE ⚠ SUR LES SCHÈMAS DE PRINCIPE, LES VUES EXPLOSÈES ET LES LISTES DE PIECES SONT D'UNE IMPORTANCE CRITIQUE POUR LA SÈCURITÈ DU FONCTIONNEMENT, NE LES REMPLACER QUE PAR DES COMPSANTS SONY DONT LE NUMÈRO DE PIÈCE EST INDIQUÈ DANS LE PRÈSENT MANUEL OU DANS DES SUPPLÈMENTS PUBLIÈS PAR SONY.

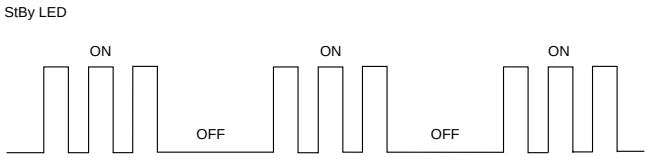
FE-1A SELF DIAGNOSTIC SOFTWARE

The identification of errors within the FE-1A chassis is triggered in one of two ways :- 1: Busy or 2: Device failure to respond to IIC. In the event of one of these situations arising the software will first try to release the bus if busy (Failure to do so will report with continuous flashing LED) and then communicate with each device in turn to establish if a device is faulty. If a device is found to be faulty the relevant device number will be displayed through the LED (Series of flashes which must be counted) See Table 1., non fatal errors are reported using this method.
Each time the software detects an error it is stored within the NVM. See Table 2.

Table 1

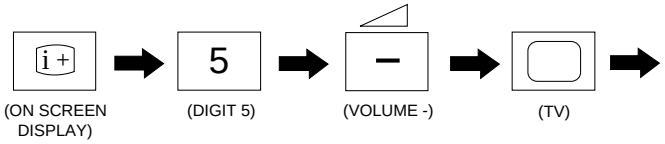
ERROR	LED ERROR COUNT
No error	00
Not allowed (may be confused with Sircs response flash!)	01
Protection circuit trip < ANY TIME >	02
Reserved	03
No vertical sync	04
AKB	05
IIC bus clock and/or data lines low at Power ON	06
NVM no IIC bus acknowledge at Power ON	07
Jungle controller no IIC acknowledge at Power ON	08
Tuner no acknowledge at Power ON	09
Sound processor no acknowledge at Power ON	10

Flash Timing Example : e.g. error number 3



How to enter into Table 2

1. Turn on the main power switch of the TV set and enter into the 'Standby Mode'.
2. Press the following sequence of buttons on the Remote Commander.



3. The following table will be displayed indicating the error count.

Table 2

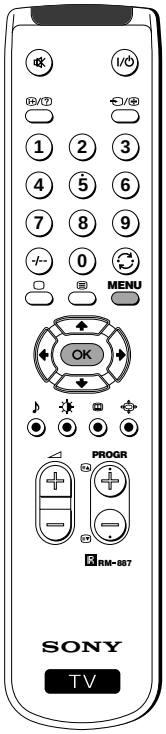
Error	Times
2	-
3	-
4	-
5	-
6	-
7	-
8	-
9	-
10	-

Note: To clear the error count data press '80' on the Remote commander.

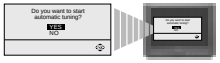
The operating instructions mentioned here are partial abstracts from the ‘Operating Instruction Manual’. The page numbers of the ‘Operating Instruction Manual’ remain as in the manual.

Automatically Tuning the TV using the Remote Control

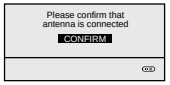
You need to tune the TV to receive channels (TV Broadcast). By following the instructions below, this TV automatically searches and stores all available channels for you.
After having selected the language, a new menu appears automatically on the TV screen asking you to automatically tune the TV. However, if you need to change or repeat the tuning afterwards (e.g. when you move house), select the menu AUTO PROGRAMME in the (SET UP) menu and proceed in the same way as described below in step 1 or, please refer to the section "Automatically Tuning the TV using the TV buttons" of this instruction manual.



1 Press the **OK** button on the remote control to select **YES**.
A new menu appears automatically on the screen asking you to check that the antenna is connected.



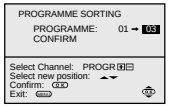
2 Confirm that the antenna is connected and then press the **OK** button.



The automatic tuning starts and the message "Searching..." flashes on the screen.

⚠ This procedure could take some minutes.

When the automatic tuning is finished, the Programme Sorting menu appears on the TV screen.

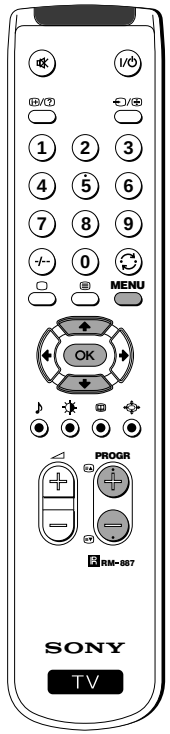


Notes:
- To stop the automatic tuning, press the **MENU** button.
- If you stop the automatic tuning by pressing the **MENU** button, the Programme Sorting menu does not appear automatically on the TV screen.

»»»

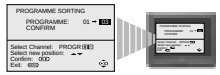
Changing the Programme Order of the TV channels

After all available channels (TV Broadcast) are captioned and stored, a new menu appears automatically on the screen to change the order in which the channels appear on the screen.
However, if you wish to rearrange the order of the channels afterwards, select the menu PROGRAMME SORTING in the (SET UP) menu and proceed in the same way as described in the b) section of this chapter.



a) If you do not wish to change the channel order:

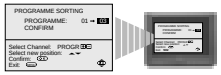
1 Press the **MENU** button to exit and return to the normal TV screen.



Your TV is now ready for use.

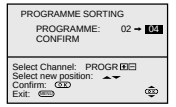
b) If you wish to change the channel order:

1 Press the **PROGR +** or **-** button until the channel (TV Broadcast) you wish to rearrange appears on the screen.



2 Press the ↑ or ↓ button to select the new programme number position for your selected channel (TV Broadcast), then press the **OK** button.

The word **CONFIRM** is highlighted for a few seconds to confirm that the new programme position is stored.



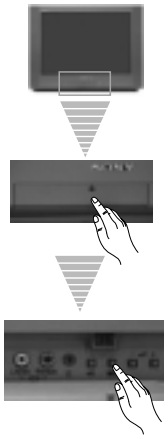
3 Repeat steps 1 and 2 if you wish to change the order of the other channels on your TV.

4 Press the **MENU** button to exit and return to the normal TV screen.

Your TV is now ready for use.

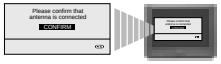
Automatically Tuning the TV using the TV buttons

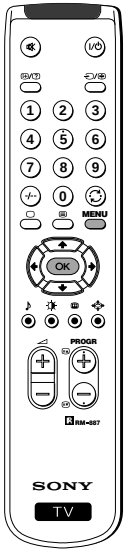
Besides the explanation in the section “Automatically Tuning the TV using the Remote Control“, by following the instructions below, this TV also searches and stores automatically all available channels using just one button of the TV set.



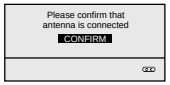
1 Press the flap on the front of the TV by pressing on the ⏚ mark to reveal the front control panel.

2 Press and hold in the ⏭ button on the TV set for some seconds, until a menu appears automatically on the screen asking you to check that antenna is connected.

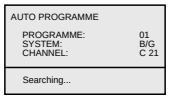




3 Confirm that the antenna is connected and then press the **OK** button.



The automatic tuning starts and the message "Searching..." flashes on the screen.



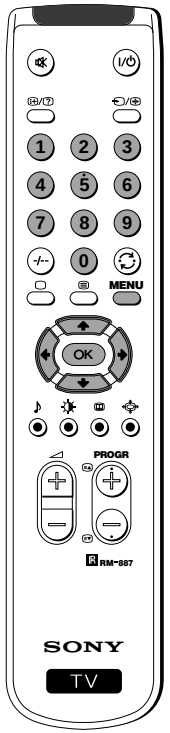
⚠ This procedure could take some minutes.

When the automatic tuning procedure is complete, the menu disappears from the TV screen and your TV is now ready for use.

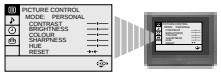
Note: To stop the automatic tuning, press the **MENU** button on the remote control.

Manually Tuning the TV

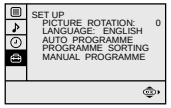
Use this function to preset channels or a video input source one by one to the programme order of your choice.



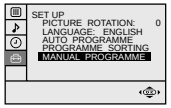
1 Press the **MENU** button on the remote control to display the menu on the TV screen.



2 Press the ↓ button to select the 🧰 symbol, then press the → button to enter to the **SET UP** menu.

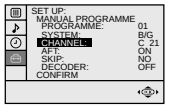


3 Press the ↓ button to select **MANUAL PROGRAMME**, then press the → button.

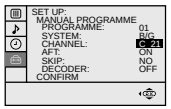


4 With the cursor highlighting **PROGRAMME**, press the → button and then, press the ↓ or ↑ button to select on which programme number you want to preset a channel. Press the ← button.

5 Press the ↓ button to select **CHANNEL**, then press the → button. Press ↓ or ↑ button to select the channel tuning, "C" for terrestrial channels or "S" for cable channels. Press the → button.



6 Press the number buttons to enter the channel number of the TV Broadcast or press the ↑ or ↓ button to search for the next available channel.
If you do not wish to store this channel, press the ↑ or ↓ button to continue searching for the desired channel.



7 If this is the desired channel you wish to store, press the **OK** button and then, with the cursor highlighting **CONFIRM**, press the **OK** button again.

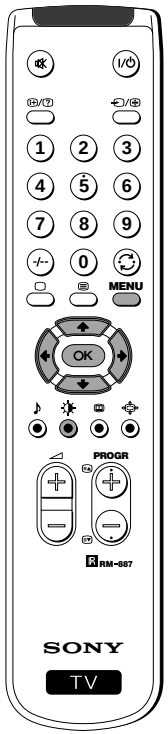
8 Repeat steps 4 to 7 if you wish to store more channels.

9 Press the **MENU** button to exit and return to the normal TV screen.

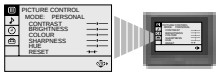
Your TV is now ready for use.

Adjusting the Picture

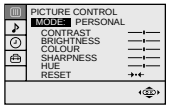
Although the picture is adjusted at the factory, you can modify it to suit your own taste.



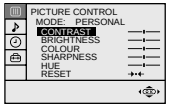
1 Press the **MENU** button on the remote control to display the menu on the TV screen.



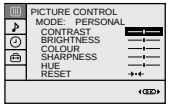
2 Press the ➧ button to enter to the **PICTURE CONTROL** menu.



3 Press the ➧ or ➦ button to select the item you wish to change.



4 With the cursor highlighting the item you wish to change, press the ➧ button.
(Refer to the table below for the effect of each control).



PICTURE CONTROL	OPERATION / EFFECT
MODE	➧ PERSONAL (for individual settings) ➧ LIVE (for live broadcast programmes) ➧ MOVIE (for films)
CONTRAST	Less ◖ ◗ More
BRIGHTNESS*	Darker ◖ ◗ Brighter
COLOUR*	Less ◖ ◗ More
SHARPNESS*	Softer ◖ ◗ Sharper
HUE**	Greenish ◖ ◗ Reddish
RESET	OK Resets picture to the factory preset levels.

* Can be only altered if PERSONAL MODE is selected.
** Only avalaible for NTSC colour signal (e.g: US video tapes).

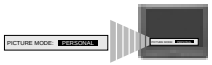
5 Press the ➧/➦ or ◖/◗ button to alter the selected item, then press the **OK** button to store the new adjustment.

6 Repeat steps 3 to 5 to alter the other items.

7 Press the **MENU** button to exit and return to the normal TV screen.

Changing Picture Mode Quickly

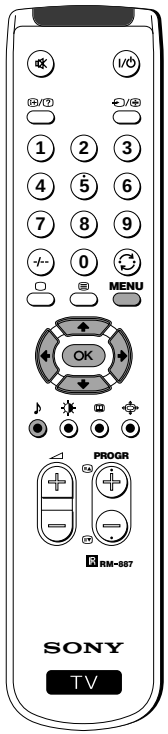
1 Press the ✲ button on the remote control to directly access the **PICTURE MODE**.



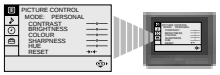
2 Press the ➧ button to select your desired picture mode (**PERSONAL**, **LIVE** or **MOVIE**).

Adjusting the Sound

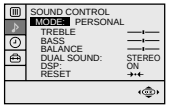
Although the sound is adjusted at the factory, you can modify it to suit your own taste.



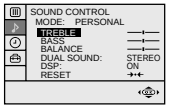
1 Press the **MENU** button on the remote control to display the menu on the TV screen.



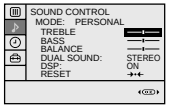
2 Press the ➧ button to select the ♪ symbol, then press the ➧ button to enter to the **SOUND CONTROL** menu.



3 Press the ➧ or ➦ button to select the item you wish to change.



4 With the cursor highlighting the item you wish to change, press the ➧ button.
(Refer to the table below for the effect of each control).



SOUND CONTROL	OPERATION / EFFECT
MODE	➧ PERSONAL (for individual settings) ➧ JAZZ ➧ POP ➧ ROCK
TREBLE*	Less ◖ ◗ More
BASS*	Less ◖ ◗ More
BALANCE	Left ◖ ◗ Right
DUAL SOUND	• *For a stereo broadcast:* ➧ MONO ➦ STEREO • *For a bilingual broadcast:* ➧ A (for channel 1 or Mono sound) ➧ B (for channel 2)
DSP (Digital sound Processor)	ON ◖ ◗ OFF
RESET	OK Resets sound to the factory preset levels.

* Can be only altered if PERSONAL MODE is selected.

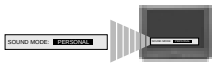
5 Press the ➧/➦ or ◖/◗ button to alter the selected item, then press the **OK** button to store the new adjustment.

6 Repeat steps 3 to 5 to alter the other items.

7 Press the **MENU** button to exit and return to the normal TV screen.

Changing Sound Mode Quickly

1 Press the ♪ button on the remote control to access directly to the **SOUND MODE**.



2 Press the ➧ button to select your desired sound mode (**PERSONAL**, **JAZZ**, **POP** or **ROCK**).

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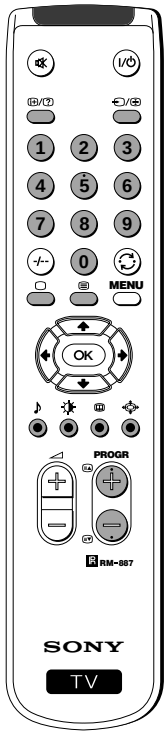
Viewing Teletext

Teletext is an information service transmitted by most TV stations.

Make sure to use a TV channel with a strong signal, otherwise teletext errors may occur.



Selecting Teletext

1 Select the TV channel which carries the teletext service you wish to view.

2 Press the ☰ button on the remote control to switch on the teletext.

3 Input three digits for the page number, using the numbered buttons on the remote control. (if you have made a mistake, type in any three digits and then, re-enter the correct page number).

4 Press the ▢ button to switch off teletext.

Using other Teletext functions

TO	PRESS THE BUTTON
Access the next or preceding page	for next page or for the preceding page
Superimpose teletext on to the TV	Press ☰ again to cancel teletext mode.
Freeze a teletext page	Press again to cancel the freeze.
Reveal concealed information (e.g: answer to a quiz)	Press ? again to cancel.

Using Fastext

Fastext lets you access pages with one button stroke.

When Fastext is broadcast, a colour coded menu appears at the bottom of the teletext page. Press the colour button (red, green, yellow or blue) on the remote control to access the corresponding page.

Using Optional Equipment

You can connect optional audio or video equipment to your TV, such as a VCR, a camcorder or a video game as shown below.

Select and View the Input Signal

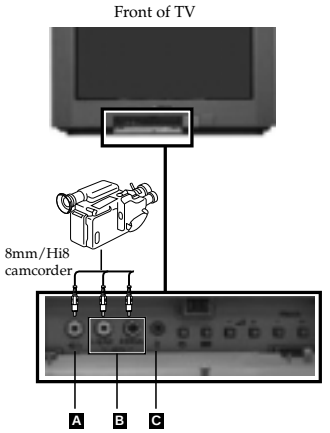
1 Connect your equipment to the designated TV socket.

2 Press the button repeatedly on your remote control until the correct input symbol appears on the TV screen.

Symbol	Input signals
1	• Audio/video input signal through the Euro AV connector **E**
	• RGB input signal through the Euro AV connector **E**
2	• Audio/video input signal through the Euro AV connector **D**
S2	• S video input signal through the Euro AV connector **D**
3	• Video input signal through the phono socket **A** and Audio input signal through **B**

3 Switch on the connected equipment.

4 To return to normal TV picture, press the ▢ button on the remote control.



Additional Information

Connecting a VCR
Plug in VCR to the socket **E** on the rear of the TV set.
We recommend you tune in the VCR signal to TV programme number '0' using the section "Manually Tuning the TV" of this instruction manual.

Connecting Headphones
Plug in your headphones to the socket **C** on the front of the TV set.

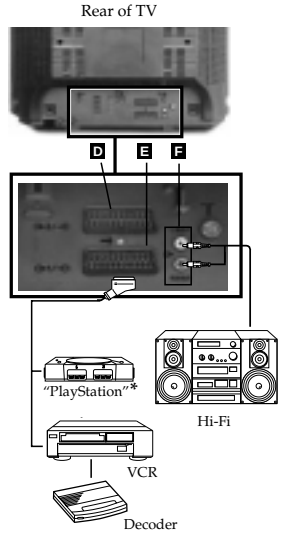
Connecting Decoders
Plug in decoders to the socket **E** on the rear of the TV.

Connecting to External Audio Equipment
Plug in your Hi-Fi equipment to the **F** sockets on the rear of the TV if you wish to amplify the audio output from the TV.

For Mono Equipment
Connect the phono plug to the L/G/S/I socket on the front of the TV and select 2 input signal using the instructions above. Finally, refer to the "Adjusting the Sound" section of this manual and select "A" on the sound menu screen.

* "PlayStation" is a product of Sony Computer Entertainment, Inc.

* "PlayStation" is a trademark of Sony Computer Entertainment, Inc.



Troubleshooting

Here are some simple solutions to the problems which may affect the picture and sound.

Problem	Solution
No picture (screen is dark), no sound	• Plug the TV in. • Press the ⏻ button on the front of TV. • If the ⏻ indicator is on, press I/⏻ button or a programme number button on the remote control. • Check the aerial connection. • Check that the selected video source is on. • Turn the TV off for 3 or 4 seconds and then turn it on again using the ⏻ button on the front of the TV.
Poor or no picture (screen is dark), but good sound	• Using the MENU system, select the Picture Adjustment display. Adjust the brightness, picture and colour balance levels. • From the Picture Adjustment display select RESET to return to the factory settings.
Poor picture quality when watching a RGB video source.	• Press the button repeatedly on the remote control until the RGB symbol is displayed on the screen.
Good picture, no sound	• Press the +/– button on the remote control. • If is displayed on the screen, press the button on the remote control.
No colour on colour programmes	• Using the MENU system, select the Picture Adjustment display. Adjust the colour balance. • From the Picture Adjustment display select RESET to return to the factory settings.
Distorted picture when changing programmes or selecting teletext	• Turn off any equipment connected to the 21 pin Euro connector on the rear of the TV.
Noisy picture when viewing TV channel	• Adjust Fine Tuning to obtain better picture reception.
Remote control does not function	• Replace the batteries.
The standby indicator ⏻ on the TV flashes even though the "Wake Up Timer" function is not use.	• Contact to your nearest Sony service centre.

• If you continue to have these problems, have your TV serviced by qualified personnel.
• NEVER open the casing yourself.

Specifications

TV system
B/G/H

Colour system
PAL, SECAM
NTSC 3.58, 4.43 (only Video In)

Channel coverage
VHF: E2-E12
UHF: E21-E69
CATV: S1-S20
HYPER: S21-S41

Picture tube
Flat Display Trinitron
Approx. 55 cm (21 inches) (Approx. 51 cm picture measured diagonally), 90° deflection

Rear Terminals
- 1/ 21-pin Euro connector (CENELEC standard) including audio/video input, RGB input, TV audio/video output
- 2/S 21-pin Euro connector (CENELEC standard) including audio/video input, S-video input, monitor audio/video output
- Audio outputs - phono jacks

Front Terminals
- 3 video input - phono jack
- 3 audio inputs - phono jacks
- Headphones jack - minijack stereo

Sound output
2x7 W (RMS)

Power consumption
80 W

Standby Power consumption
0.5 W

Dimensions (w x h x d)
Approx. 545 x 446 x 485 mm

Weight
Approx. 26.5 kg

Accessories supplied
1 Remote Control (RM-887)
2 Batteries (IEC designated)

Other features
TELETEXT, Fastext, TOPtext
Sleep Timer
Wake Up Timer
Smartlink

Design and specifications are subject to change without notice.

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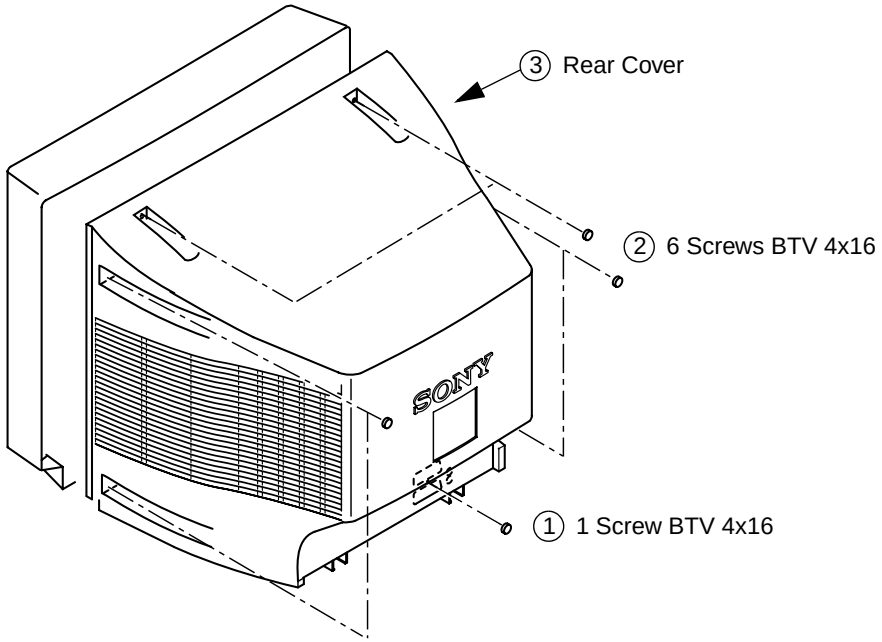
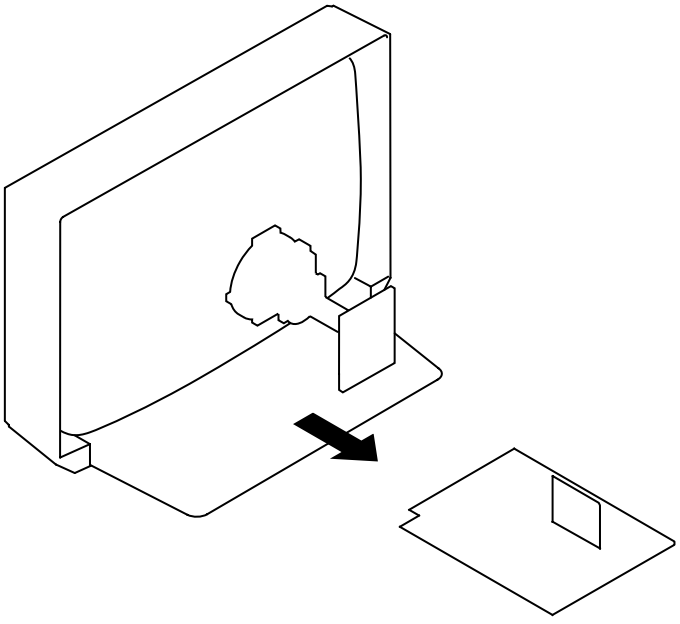
SECTION 2
DISASSEMBLY

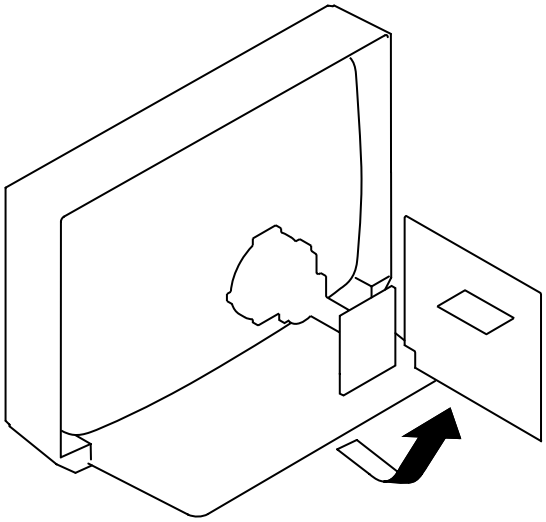
2-1. REAR COVER REMOVAL



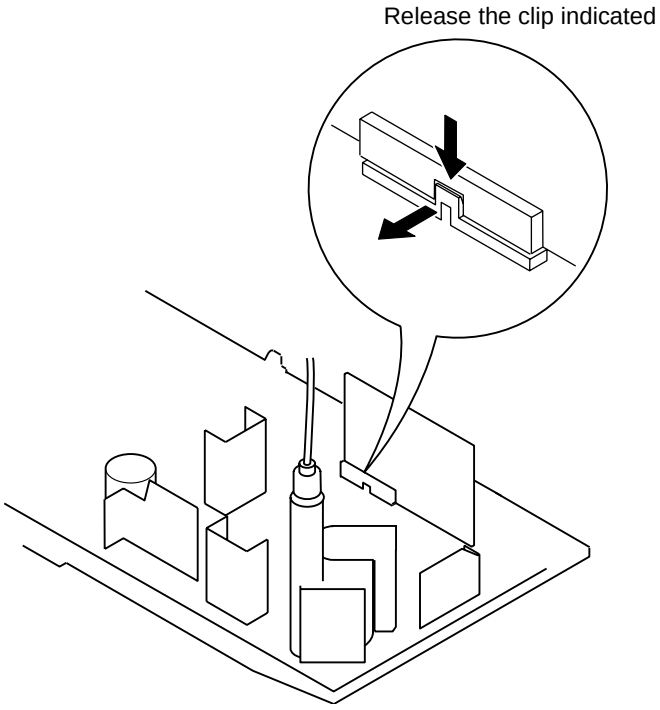
2-2. CHASSIS ASSY REMOVAL

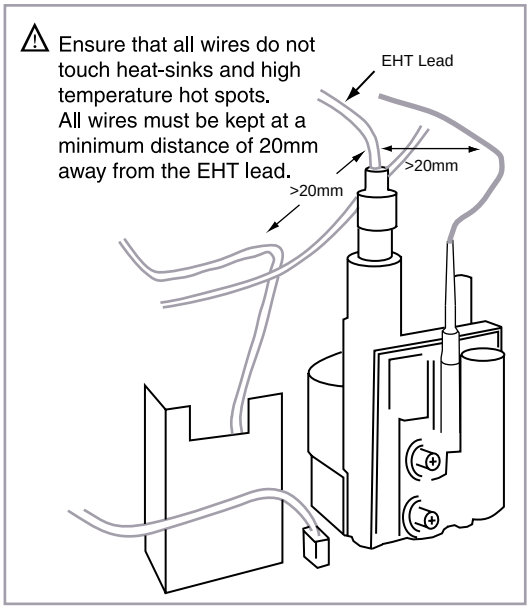


2-3. SERVICE POSITION

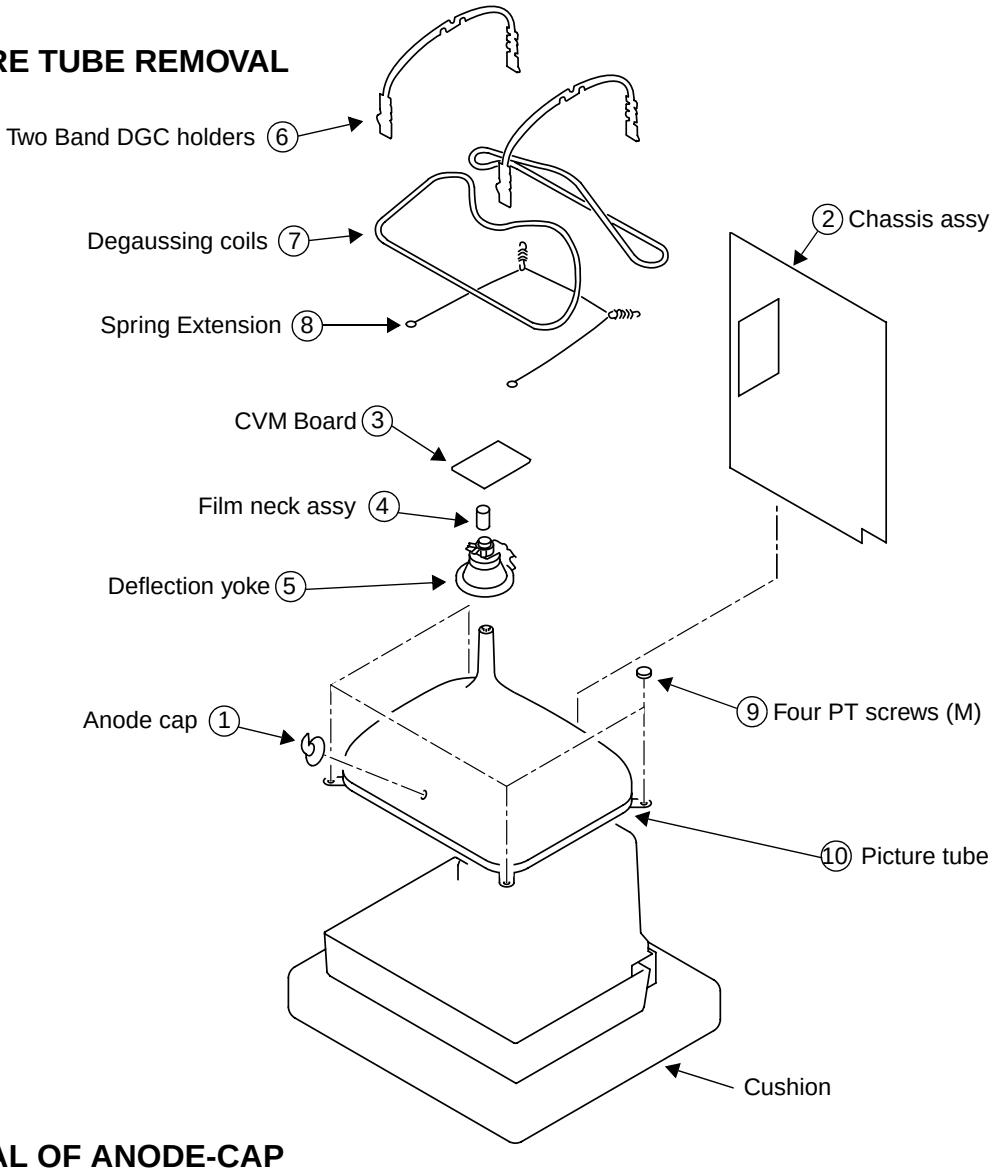


2-4. S1 BOARD REMOVAL




Ensure that all wires do not touch heat-sinks and high temperature hot spots.
All wires must be kept at a minimum distance of 20mm away from the EHT lead.
EHT Lead
>20mm
>20mm

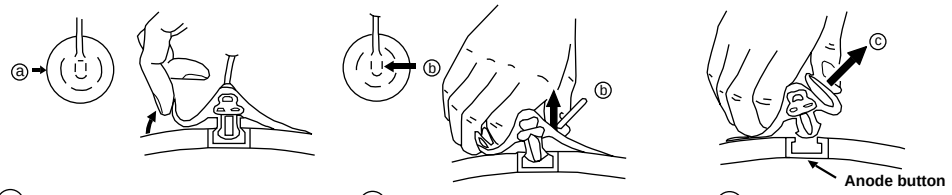
2-5. PICTURE TUBE REMOVAL



- **REMOVAL OF ANODE-CAP**

Note : Short circuit the anode of the picture tube and the anode cap to the metal chassis, CRT shield or carbon paint on the CRT, after removing the anode.

*** REMOVING PROCEDURES.**



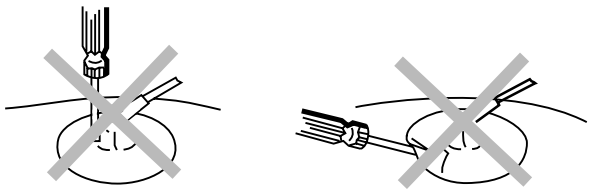
① Turn up one side of the rubber cap in the direction indicated by the arrow ⓐ

② Using a thumb pull up the rubber cap firmly in the direction indicated by the arrow ⓑ

③ When one side of the rubber cap is separated from the anode button, the anode-cap can be removed by turning up the rubber cap and pulling it up in the direction of the arrow ⓒ

- **HOW TO HANDLE THE ANODE-CAP**

① To prevent damaging the surface of the anode-cap do not use sharp materials.
② Do not apply too great a pressure on the rubber, as this may cause damage to the anode connector.
③ A metal fitting called a shatter hook terminal is fitted inside the rubber cap. Do not turn the rubber foot over excessively this may cause damage if the shatter hook sticks out.

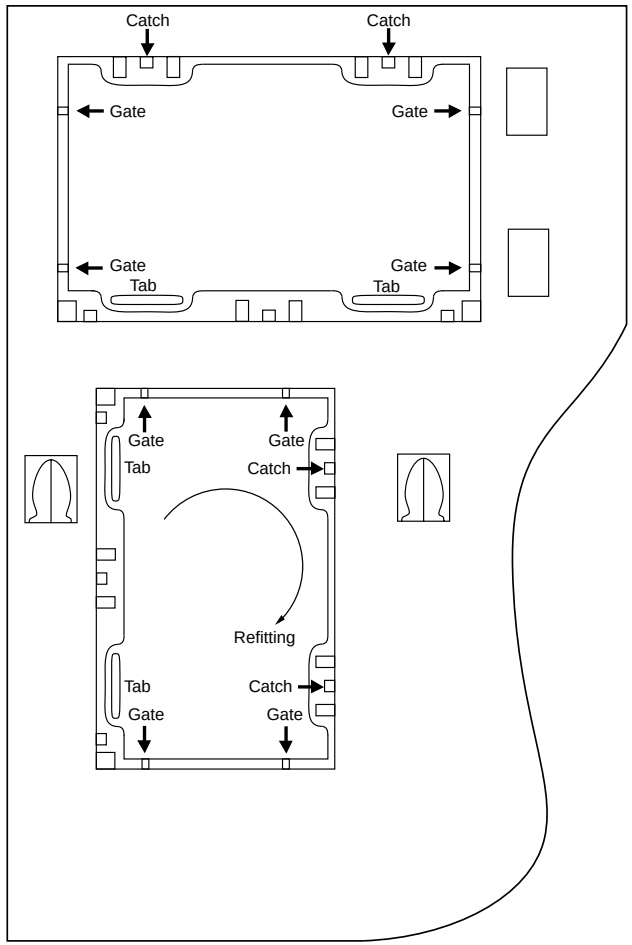


2-6.REMOVAL AND REPLACEMENT OF THE MAIN-BRACKET BOTTOM PLATES.

(1) REMOVING THE PLATES

In the event of servicing being required to the solder side of the A Board printed wiring board, the bottom plates fitted to the main chassis bracket require to be removed.
This is performed by cutting the gates with a sharp wire cutter at the locations shown and indicated by arrows.

Note : There are 2 plates fitted to the main bracket and secured by 4 gates.
Only remove the necessary plate to gain access to the printed wiring board.

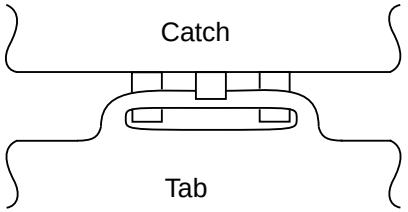


⚠ For safety reasons, on no account should the plates be removed and not refitted after servicing.

(2) REFITTING THE PLATES

Because the plates differ in size it is important that the correct plates are refitted in their original location.

Please note that the plates need to be rotated 180 degrees from the cut position to allow the tabs to be fitted in the catch positions.



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SECTION 3
SET-UP ADJUSTMENTS

- When complete readjustment is necessary or a new picture tube is installed, carry out the following adjustments.
- Unless there are specific instructions to the contrary, carry out these adjustments with the rated power supply.
- Unless there are specific instructions to the contrary, set the controls and switches to the following settings :

Contrast ..... 80% [or remote control normal]

Brightness 50%

Carry out the following adjustments in this order :

3-1. Beam Landing
3-2. Convergence
3-3. Focus
3-4. White Balance

Note : Test equipment required

1. Color bar/pattern generator.
2. Degausser.
3. Oscilloscope.
4. Digital multimeter.
5. DC Power supply.

Preparation:

1. In order to reduce the influence of geomagnetism on the set's picture tube, face it in an easterly or westerly direction.
2. Switch on the set's power and degauss with the degausser.

3-1. BEAM LANDING

1. Input an all white signal from the pattern generator. Set the Contrast and Brightness to normal.
2. Set the pattern generator raster signal to Red.
3. Move the deflection yoke forward and adjust with the purity control so that the Red is at the centre and the Blue and Green take up equally sized areas on each side of the screen. [See Fig.3-1 - 3-3].
4. Move the deflection yoke backwards and adjust so that the entire screen becomes Red. [See Fig.3-1]
5. Switch the raster signal to Blue, then to Green and verify the condition.
6. When the position of the deflection yoke has been determined, fasten the deflection yoke with the screws.
7. If the beam does not land correctly in all the corners, use a magnet to correct it. [See Fig.3-4]

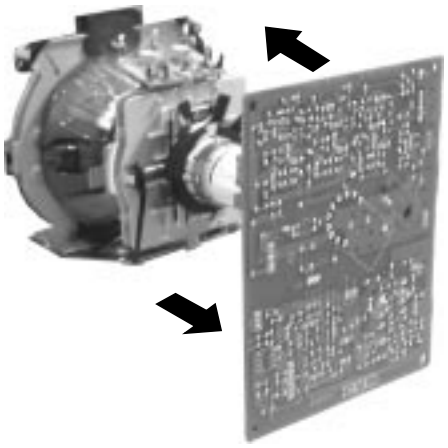


Fig. 3-1

Fig. 3-2

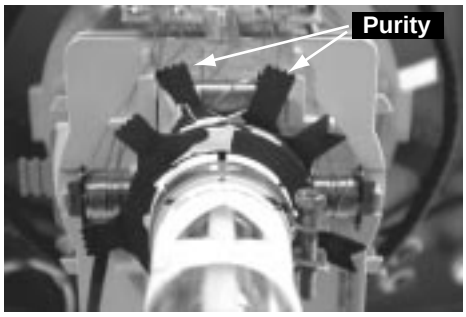
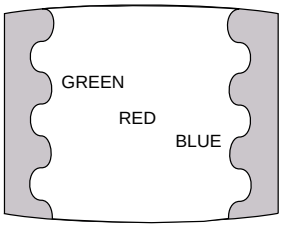


Fig. 3-3



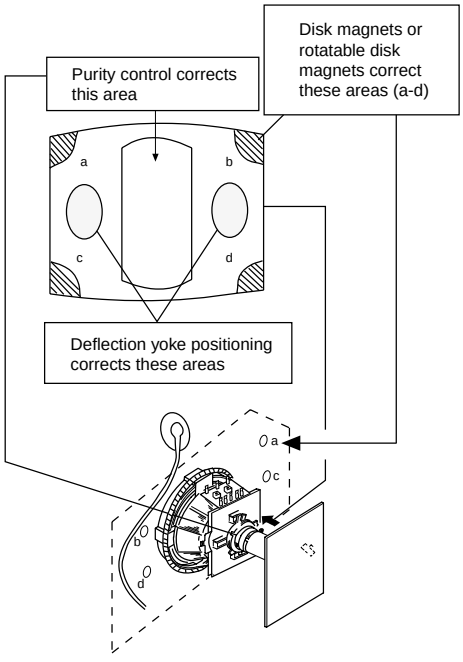


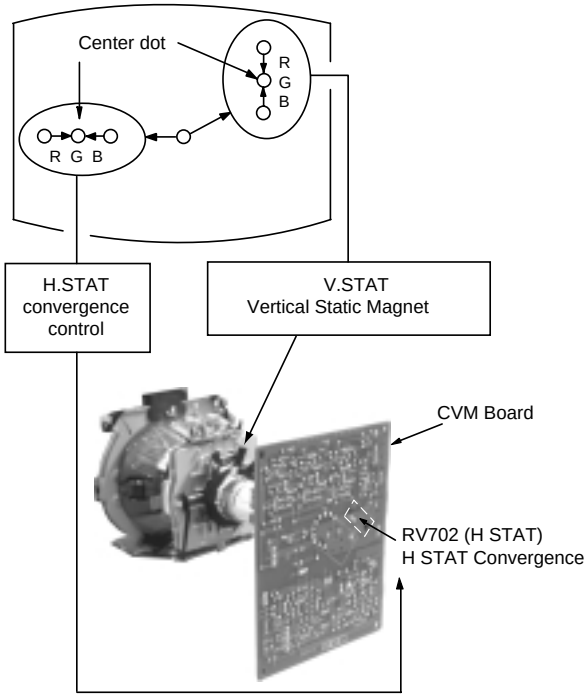
Fig. 3-4

3-2. CONVERGENCE

Preparation:

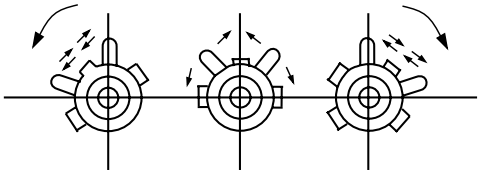
- Before starting this adjustment, adjust the focus, horizontal size and vertical size.
- Minimize the Brightness setting.
- Input a dot pattern from the pattern generator.

(1) Horizontal and vertical static convergence

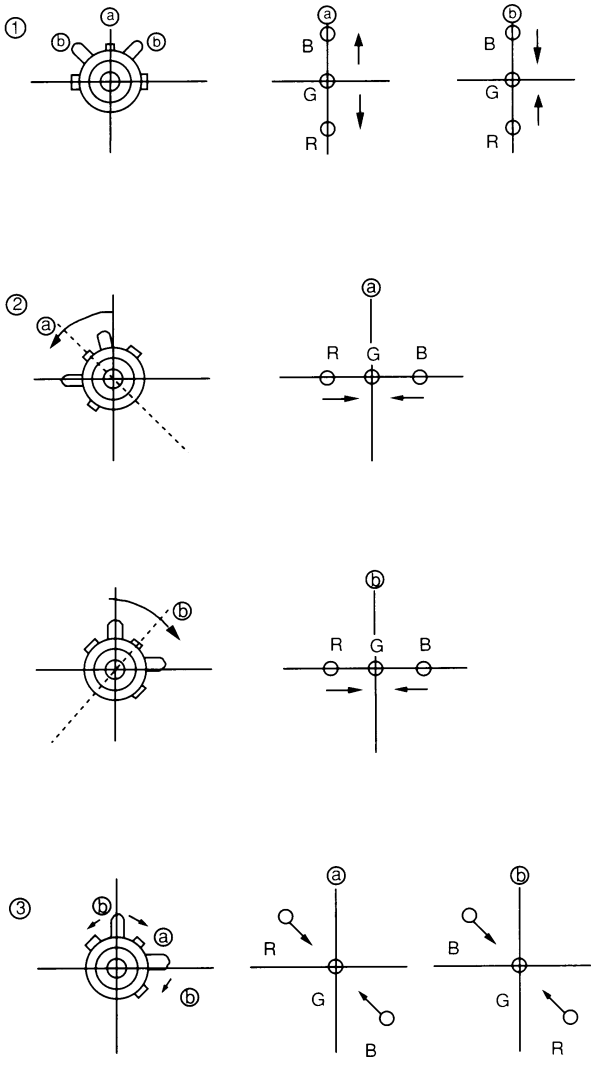


1. [Moving horizontally], adjust the H.STAT control so that the Red, Green and Blue points are on top of each other at the centre of the screen.
2. [Moving vertically], adjust the V.STAT magnet so that the Red, Green and Blue points are on top of each other at the centre of the screen.
3. If the H.STAT variable resistor is unable to bring the Red, Green and Blue points together at the centre of the screen, adjust the horizontal convergence with the H.STAT variable resistor and the V.STAT magnet in the manner indicated below. [In this case, the H.STAT variable resistor and the V.STAT magnet influence each other].

- Tilt the V.STAT magnet and adjust the static convergence by opening or closing the V.STAT magnet.



4. If the V.STAT magnet is moved in the direction of the (a) and (b) arrows, the Red, Green and Blue points move as indicated below.



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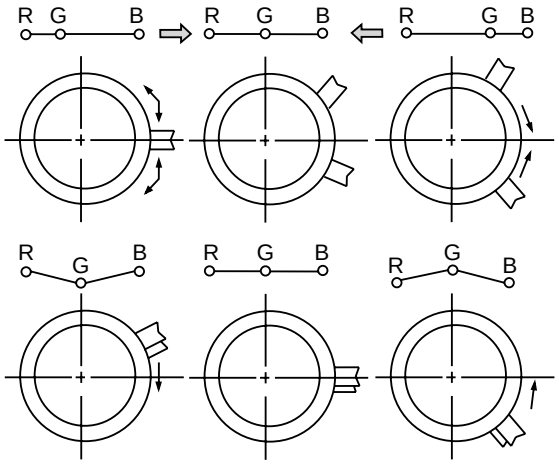
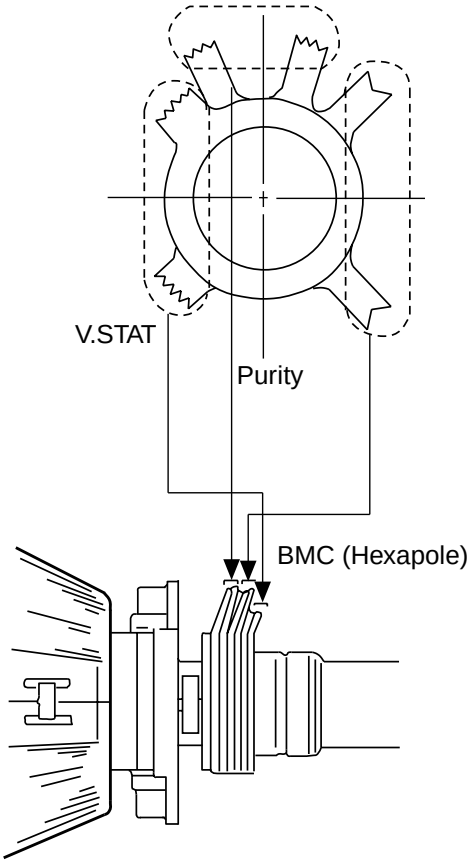
- **Operation of the BMC (Hexapole) magnet.**



- The respective dot position resulting from moving each magnet interact, so be sure to perform adjustment whilst tracking.
  Use the H.STAT VR to adjust the Red, Green and Blue dots so that they coincide at the centre of the screen
  (by moving the dots in the horizontal direction).



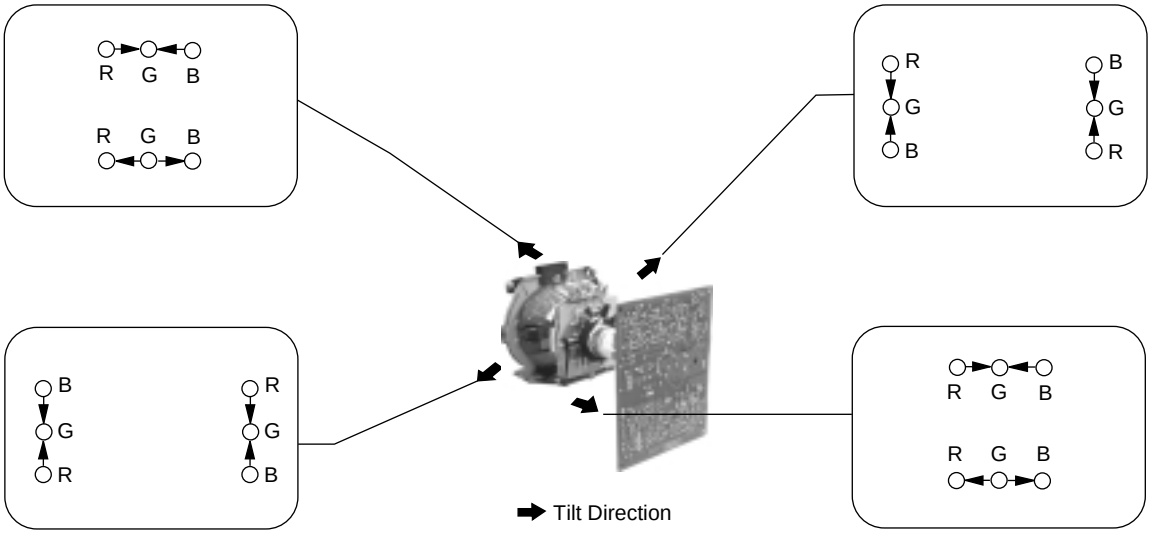
(2) Dynamic convergence adjustment.

Preparation:

- Before starting this adjustment, adjust the horizontal and vertical static convergence.

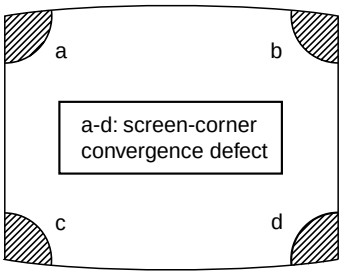
1. Remove the deflection yoke spacer.
2. Tilt the deflection yoke as indicated in the figure below and optimize the convergence.
3. Re-install the deflection yoke spacer.

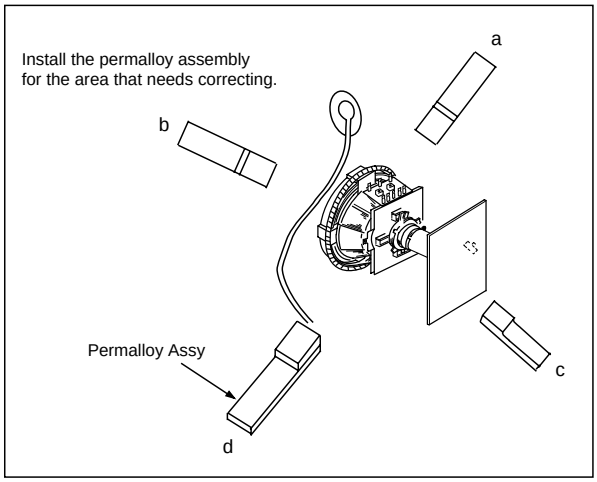
Note : This adjustment will affect the geometry of the display, therefore adjust to obtain the optimum setting.

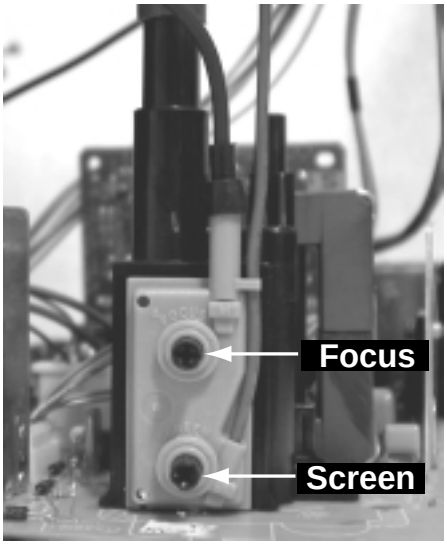


(3) Screen corner convergence.

- If you are unable to adjust the corner convergence properly, correct them with the use of permalloy assemblies.







3-3. FOCUS

1. Receive a television broadcast signal.
2. Normalise the picture setting.
3. Adjust the focus control on the flyback transformer for the best focus at the centre of the screen.
   Bring only the centre area of the screen into focus, the magenta ring appears on the screen. In this case, adjust the focus to optimize the screen uniformly.

3-4. WHITE BALANCE

G2 Screen Adjustment

1. Switch the TV set into AV mode [apply a cross-hatch signal].
2. Enter into the 'Service mode' and select 'Picture Control'.
3. Enter 'Picture Control' and select 'Personal' press OK.
4. Return to 'Picture Control' menu and select 'Reset'.
5. Measure the voltages on the 3 cathodes of the CRT, Kr,Kg and Kb using an oscilloscope with a 100:1 probe.
6. Connect the oscilloscope to the CRT cathode which recorded the highest voltage and adjust [RV702 SCREEN] located on the C Board to obtain a reading of 175V.

White Balance Adjustment

Note: Before carrying out the following adjustment perform the Sub Contrast adjustment indicated in Section 4 [Circuit Adjustments]

1. Input an all white signal from the pattern generator.
2. Enter into the Service Mode.
3. Enter into the 'Picture Adjustment' service menu.
4. Select the 'Green drive' and adjust so that the white balance becomes optimum.
5. Select the 'Blue drive' and adjust so that the white balance becomes optimum.
6. Press the 'TV' button on the remote commander to return to TV operation.

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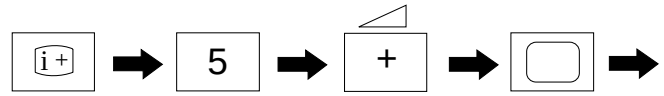
SECTION 4
CIRCUIT ADJUSTMENTS

4-1. ELECTRICAL ADJUSTMENTS

Service adjustments to this model can be performed using the supplied Remote Commander RM-887.

HOW TO ENTER INTO SERVICE MODE

1. Turn on the main power switch and enter into the stand-by mode.
2. Press the following sequence of buttons on the Remote Commander.



(ON SCREEN DISPLAY) (DIGIT 5) (VOLUME +) (TV)

- 'TT--' will appear in the upper right corner of the screen.
  Other status information will also be displayed.

3. Press 'MENU' on the remote commander to obtain the following menu on the screen.

```
TEST MENU

> Picture
  Geometry
  Sound
  TV Status
  AGC Adjust
  AGC Defeat
  Technical
```

4. Move to the corresponding adjustment item using the 'Green' [up] or 'Blue' [down] buttons on the Remote Commander.
5. Press the 'Yellow' button to enter into the required menu item.
6. Press the 'Menu' button on the Remote Commander to quit the Service Mode when all adjustments have been completed.

Note : The data shown in the 'TV STATUS' table is dependant on destination and country.

PICTURE	
R - Drive	Adj
G - Drive	Adj
B - Drive	Adj
R - cut - off	Adj
G - cut - off	Adj
B - cut - off	Adj
ID - start	02
ID - stop	01
ID - level	01
Bell-f0	35
Sub Colour	Adj
Sub Brightness	Adj

GEOMETRY	
V centre	Adj
V size	Adj
V Lin	Adj
S Corr	Adj
H Cent	Adj
H Size	Adj
Pin Amp	Adj
Upper Pin	Adj
Lower Pin	Adj
Upper V lin	Adj
Lower V lin	Adj
Pin Phase	Adj
V Bow	Adj
V Angle	Adj
Upper V Lin	0
Lower V Lin	0
Left HBLK	12
Right HBLK	0
CD Mode (AV)	01
EHT-comp	12

SOUND	
Nicam Error Lower	20
Nicam Error Upper	80
Nicam Error Rate	xx [Status only]
AGC Gain Level	xx [Status only]

TV STATUS	
Destination	A/L/E/U/D/B/K/R
Text Language	East/West

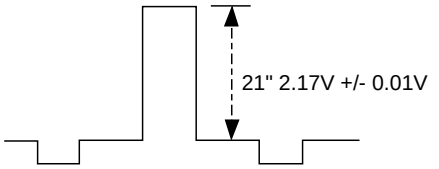
TECHNICAL	
GD - Secam	31
BD - Secam	31
RC - Secam	15
GC - Secam	15
BC - Secam	14
GD - Sports	32
BD - Sports	34
RC - Sports	14
GC - Sports	15
BC - Sports	16
Y - Delay (AV)	07

SUB BRIGHTNESS ADJUSTMENT

1. Input a Phillips colour pattern.
2. Press 'TEST' 'TEST' 13 on the Remote Commander.
3. Adjust the 'Sub-Brightness' data so that there is barely a difference between the 0 IRE and 10 IRE signal levels.

SUB CONTRAST ADJUSTMENT

1. Input a video signal that contains a small 100% white area on a black background
2. Set the picture control to maximum. ['TT01']
3. Connect an oscilloscope to Pin 1 of CN504 [A Board].
4. Enter into the 'Picture' service menu.
5. Adjust the 'R - Drive' data to obtain the following waveform.

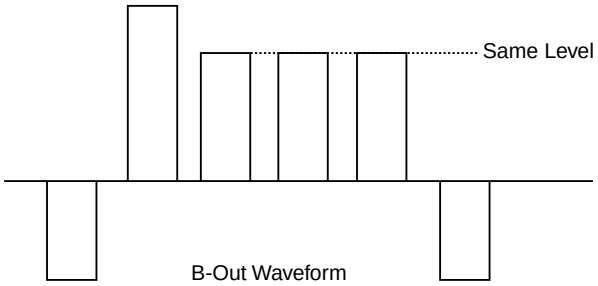


R - out Waveform

SUB COLOUR ADJUSTMENT

1. Receive a PAL colour bar signal.
2. Connect an oscilloscope to Pin 3 of CN504 [A Board].
3. Enter into the 'Picture' service menu.
4. Adjust the 'Sub Colour' data so that the Cyan, Magenta and Blue colour bars are of equal levels as indicated below.

Note: Ensure that no signal is applied to the Antenna socket while carrying out the following IF adjustments.



B-Out Waveform

SYSTEM B/G, D/K, I & L I.F ADJUSTMENT

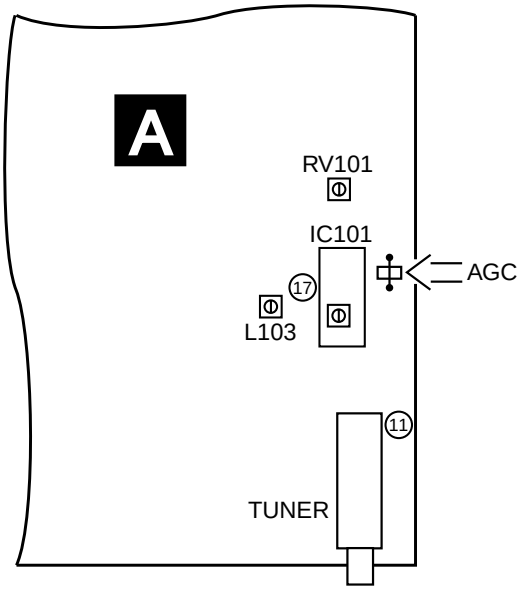
1. Input a 38.9Mhz carrier signal at 100dBuV to Pin 11 [IF output] of the tuner [TU101].
2. Measure the voltage at Pin 17 of [IC101].
3. Adjust L103 [A Board] to obtain a voltage of 1.4V +/- 0.3V.

SYSTEM L BAND 1 I.F ADJUSTMENT

1. Input a 33.9MHz carrier signal at 100dBuV to Pin 11 [IF output] of the tuner [TU101].
2. Select 'system L' + C00 [channel 00].
3. Measure the voltage at Pin 17 [IC101].
4. Adjust RV101 [A Board] to obtain a voltage of 1.4V +/- 0.3V.

TUNER AGC ADJUSTMENT

1. Receive a signal of 64dBuV / 75 ohm terminated [62dBuV / 75 ohm for B model] via the tuner antenna socket.
2. Connect a voltmeter to JW L104 [A Board].
3. Enter into the 'Test Menu'.
4. Select the 'AGC Adjust' menu item.
5. Adjust the data using the Yellow and Green buttons on the Remote Commander to obtain a voltage of 3.5V +/- 0.3V.



A Board component side

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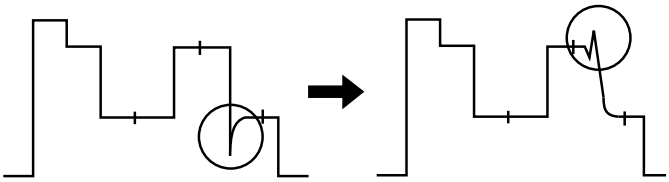
BELL FILTER ADJUSTMENT (Secam models only)

Note : Ensure that the TV set has been powered up for at least 1 minute to allow for drift before carrying out the following adjustment.

1. Input a video SECAM Colour Bar signal via AV1.
2. Connect an oscilloscope to pin 1 of CN504 [R-OUT] on the A board.
3. Enter into the 'Picture' menu and select 'Bell-f0'.
4. Decrease the register of 'Bell-f0' until the following waveform change between RED and BLUE is obtained.



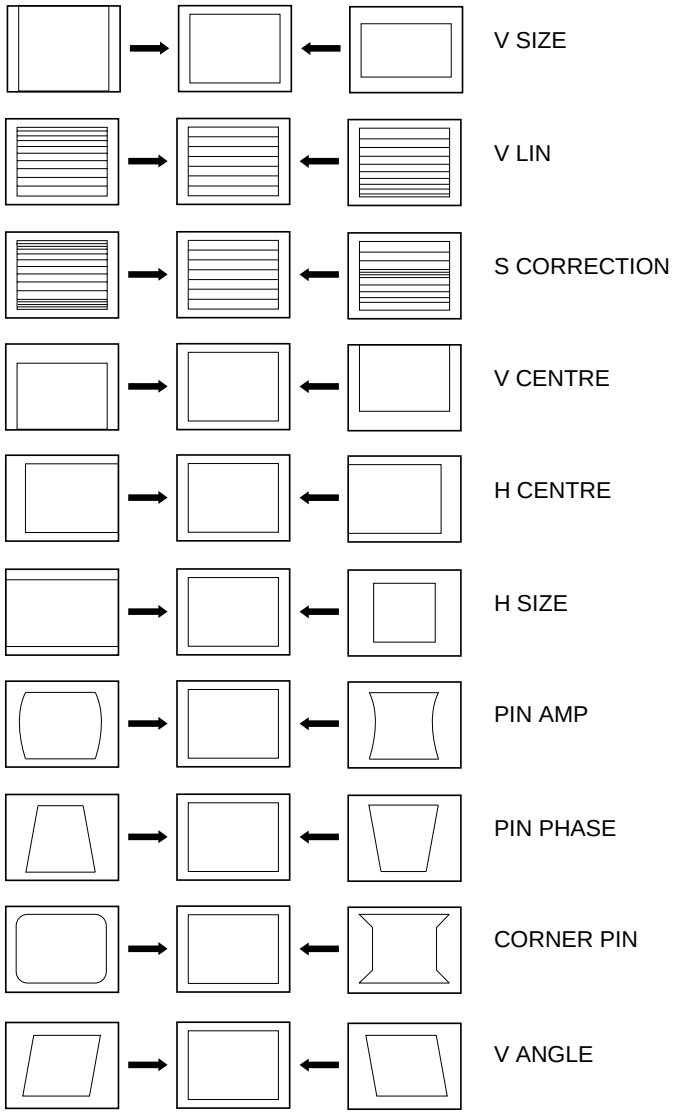
Before adjustment After adjustment

5. When the correct waveform has been obtained add an additional 7 steps to the register.

DEFLECTION SYSTEM ADJUSTMENT

1. Enter into the 'Geometry' service menu.
2. Select and adjust each item in order to obtain the optimum image.

GEOMETRY	
V centre	Adj
V size	Adj
V Lin	Adj
S Corr	Adj
H Cent	Adj
H Size	Adj
Pin Amp	Adj
Upper Pin	Adj
Lower Pin	Adj
Upper V lin	Adj
Lower V lin	Adj
Pin Phase	Adj
V Bow	Adj
V Angle	Adj
Upper V Lin	0
Lower V Lin	0
Left HBLK	12
Right HBLK	0
CD Mode (AV)	01
EHT-comp	12



4-2. TEST MODE 2:

Is available by pressing 'TEST' button twice, OSD 'TT' appears. The functions described below are available by pressing the two numbers. To release the Test mode 2, press 0 twice, or switch the TV into stand-by mode, or press the 🖵 TV button on the remote commander.

00	Cancel Test mode
01	Picture maximum
02	Picture minimum
03	Volume 35%
04	Volume 50%
05	Volume 65%
06	Volume 80%
07	Ageing mode On/Off
08	Set shipping conditions
09	Display TV Status
10	No function
11	Sub Picture Adjustment
12	Sub Colour Adjustment
13	Sub Brightness Adjustment
14	Text H position Adjustment
15	Rotation test
16	Picture level 50%
17	Audio mute ON
18	Disable Blanking
19	Toggle Factory Mode
20	No function
21	Destination A
22	Destination L
23	Destination E
24	Destination U
25	Destination D
26	Destination B
27	Destination K
28	Destination R
29	No function
30	No function
31	Auto shutoff Disable/Enable
32	RGB priority Disable/Enable
33	Rotation On/OFF
34	Text language East/West
35	Wide CRT/4:3 CRT
36	VM ON/OFF test
37	No function
38	No function
39	No function
40	No function
41	Re-initialize the NVM [Only when Prog=59]
42	Re-initialise geometry settings [Only when Prog=59]
43	No function
44	No function
45	No function
46	No function
47	No function
48	Set NVM as NON Virgin [Only when Prog=59]
49	Set NVM as Virgin [Only when Prog=59]
50	No function
51	No function
52	No function
53	No function
54	No function
55	No function
56	No function
57	No function
58	No function
59	No function
60	No function
61	Auto AGC Adjust
62	Alternative Dest B Autotuning
63	Enable/Disable Y/C input
64	Signal Quality Check for Auto Tune
65	Signal Quality NOT Checked for Auto Tune
66	No function
67	Manual AGC Adjust
68 -100	No function

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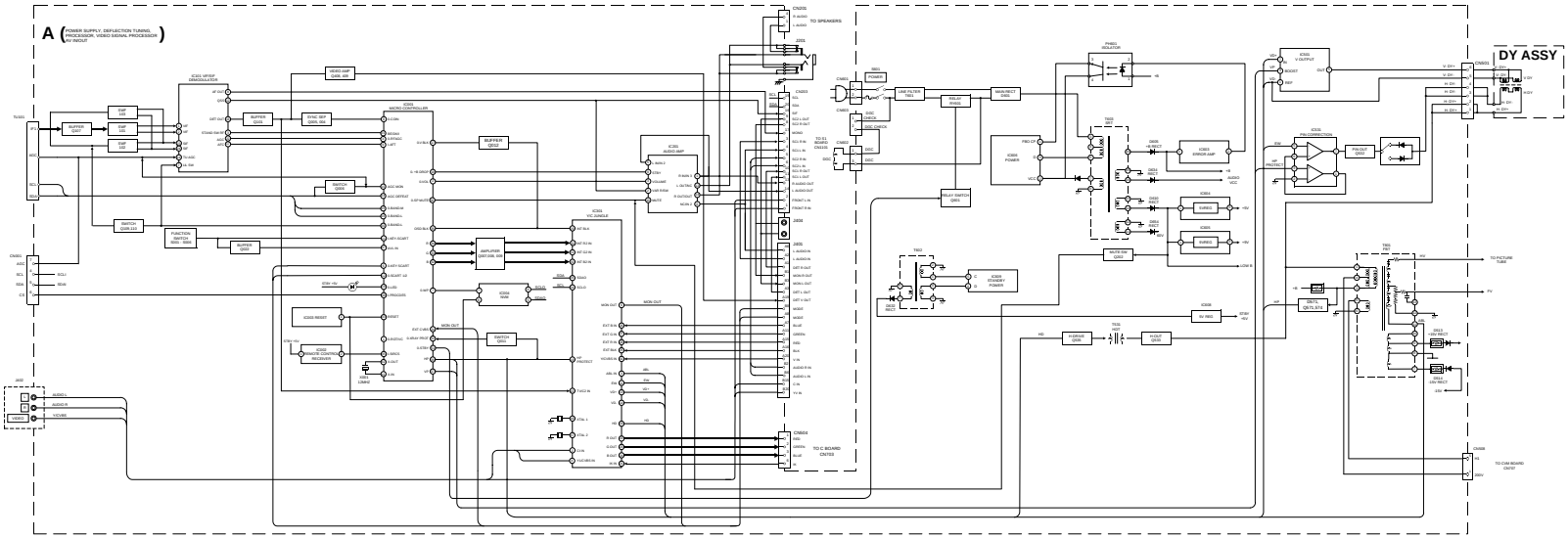
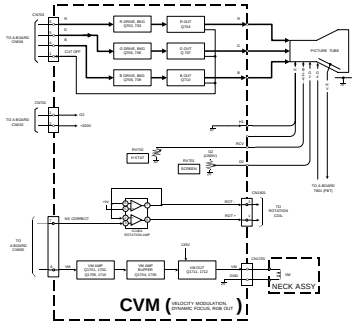
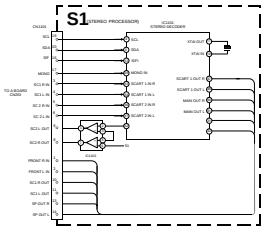
5-1. BLOCK DIAGRAMS


A (POWER SUPPLY, DEFLECTION TUNING, PROCESSOR, VIDEO SIGNAL PROCESSOR, RF INOUT)
DY ASSY
TO SPEAKERS
TO PICTURE TUBE
TO CVM BOARD CN707
TO C BOARD CN705
TO E1 BOARD CN1705





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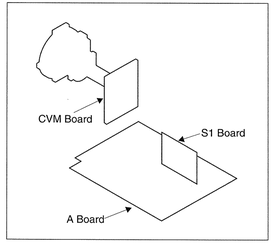
5-2. CIRCUIT BOARD LOCATION



5-3. SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

Note :

- All capacitors are in µF unless otherwise noted.
- pF : µµF 50WV or less are not indicated except for electrolytic types.
- Indication of resistance, which does not have one for rating electrical power, is as follows.

Pitch : 5mm
Electrical power rating : 1/4W

- Chip resistors are 1/10W
- All resistors are in ohms.
  k = 1000 ohms, M = 1000,000 ohms
- : nonflammable resistor.
- : fusible resistor.
- : internal component.
- : panel designation or adjustment for repair.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- All voltages are in Volts.
- Readings are taken with a 10Mohm digital mutimeter.
- Readings are taken with a color bar input signal.
- Voltage variations may be noted due to normal production tolerences.
- : B + bus.
- : B - bus.
- : RF signal path.
- : earth - ground.
- : earth - chassis.

Reference Information

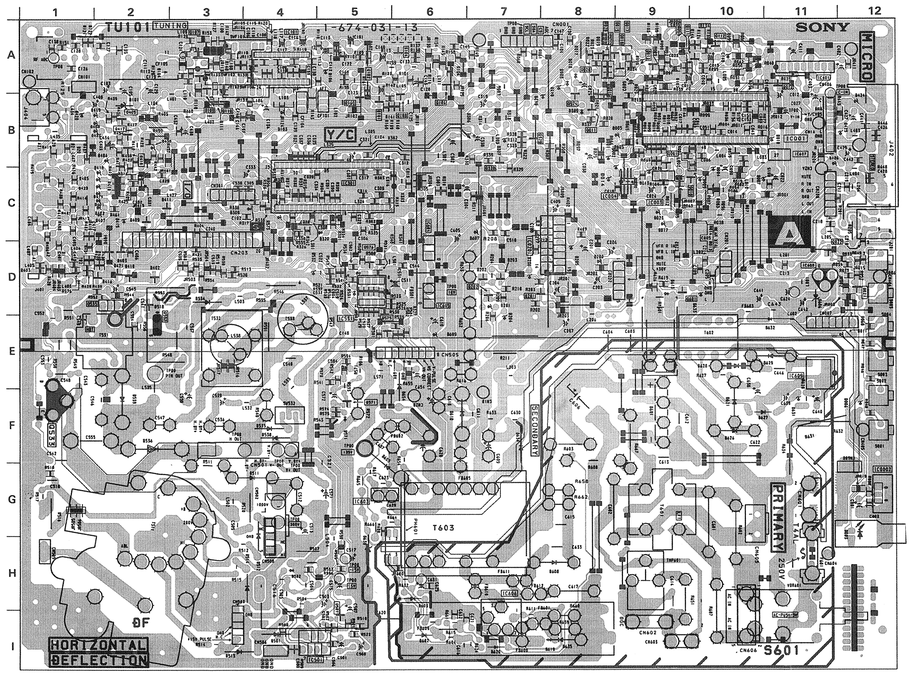
RESISTOR	**RN**	: METAL FILM
	RC	: SOLID
	FPRD	: NON FLAMMABLE CARBON
	FUSE	: NON FLAMMABLE FUSIBLE
	RS	: NON FLAMMABLE METAL OXIDE
	RB	: NON FLAMMABLE CEMENT
	RW	: NON FLAMMABLE WIREWOUND
	※	: ADJUSTMENT RESISTOR
COIL	**LF-8L**	: MICRO INDUCTOR
CAPACITOR	**TA**	: TANTALUM
	PS	: STYROL
	PP	: POLYPROPYLENE
	PT	: MYLAR
	MPS	: METALIZED POLYESTER
	MPP	: METALIZED POLYPROPYLENE
	ALB	: BIPOLAR
	ALT	: HIGH TEMPERATURE
	ALR	: HIGH RIPPLE

Note : The components identified by shading and marked ⚠ are critical for safety. Replace only with the part numbers specified in the parts list.

Note : Les composants identifiés par une trame et par une marque ⚠ sont d'une importance critique pour la sécurité. Ne les remplacer que par des pièces de numéro spécifié. specified.

A [POWER SUPPLY, DEFLECTION, TUNING, PROCESSOR
VIDEO SIGNAL PROCESSOR, AV IN/OUT

A Board



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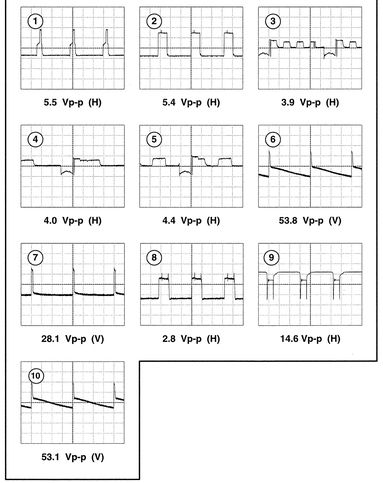
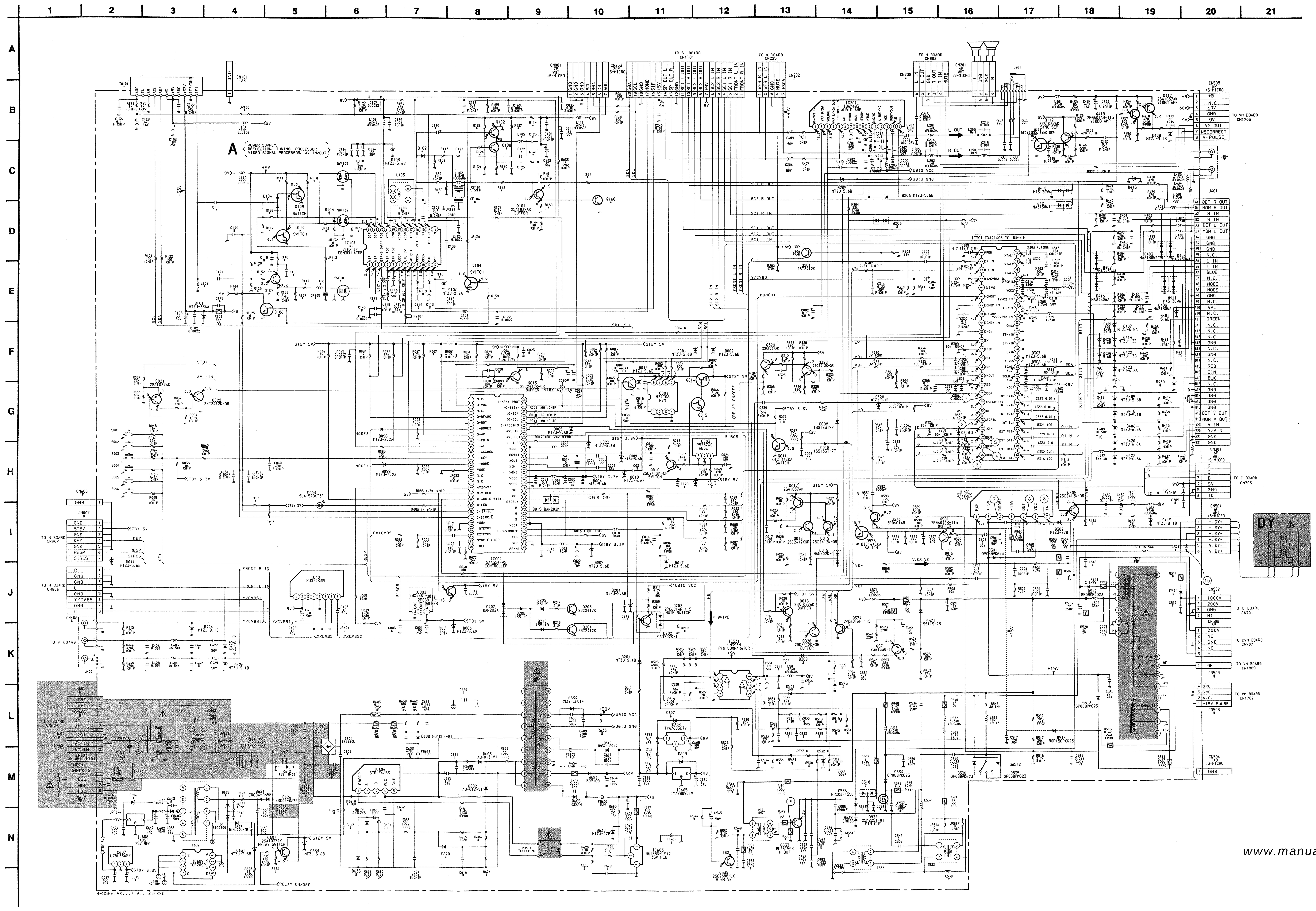
A BOARD

IC		Q532	E - 2	D411	C - 2
IC001	B - 11	Q533	F - 1	D414	C - 1
IC002	G - 12	Q535	D - 1	D415	D - 2
IC003	C - 9	Q571	F - 5	D416	D - 2
IC004	C - 9	Q574	B - 8	D418	C - 1
IC101	A - 4	Q575	E - 6	D419	B - 2
IC201	C - 7	Q601	D - 10	D420	B - 2
IC301	C - 5	**DIODE**		D421	D - 2
IC401	A - 11	D001	B - 8	D422	C -1
IC501	I - 4	D002	B - 8	D423	C - 1
IC531	D - 5	D003	G - 12	D424	B - 12
IC603	G - 5	D004	C - 10	D425	B - 12
IC604	D - 6	D005	B - 9	D426	B - 11
IC605	D - 6	D006	F - 12	D427	B - 2
IC606	I - 7	D007	C - 11	D428	B - 8
IC607	B - 11	D008	B - 8	D429	B - 8
IC608	D - 12	D009	B - 10	D430	B - 3
IC609	E - 11	D011	E - 12	D501	I - 4
TRANSISTOR		D015	C - 9	D502	H - 4
Q001	B - 9	D017	C - 9	D512	H - 3
Q010	C - 10	D018	B - 8	D513	I - 3
Q011	B - 8	D019	A - 8	D514	H - 3
Q012	B - 11	D102	A - 5	D534	D - 3
Q013	A - 9	D103	B - 4	D535	F - 4
Q016	B - 8	D106	A - 5	D536	F - 2
Q017	A - 9	D023	C - 9	D538	F - 4
Q018	A - 9	D098	A - 9	D539	F - 2
Q019	A - 9	D099	A - 10	D541	D - 5
Q020	A - 8	D101	B - 2	D571	F - 5
Q021	D - 12	D104	A - 3	D601	F - 9
Q022	D - 11	D200	D - 8	D602	I - 6
Q101	B - 5	D201	D - 7	D603	H - 6
Q102	A - 5	D202	D - 7	D605	G - 6
Q104	A - 6	D204	D - 7	D608	H - 8
Q107	A - 3	D205	D - 8	D610	F - 7
Q108	B - 6	D206	D - 7	D613	E - 9
Q109	B - 3	D306	C - 6	D619	I - 8
Q110	B - 3	D307	C - 6	D621	F - 10
Q111	A - 10	D320	C - 4	D626	F - 10
Q112	A - 10	D401	C - 1	D627	F - 10
Q160	B - 5	D402	D - 2	D629	E - 11
Q201	D - 7	D403	D - 2	D631	F - 11
Q202	D - 7	D404	D - 2	D632	E - 10
Q328	C - 7	D405	C - 1	D633	E - 9
Q329	B - 7	D406	C - 2	D634	D - 10
Q405	B - 2	D407	C - 2	D654	F - 6
Q417	B - 2	D408	B - 2		
Q418	B - 2	D409	C - 2		
Q501	I - 5	D410	D - 2		

WAVEFORMS A BOARD





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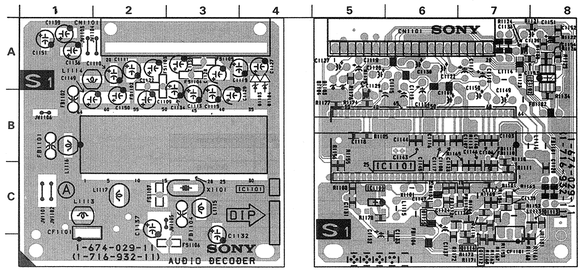
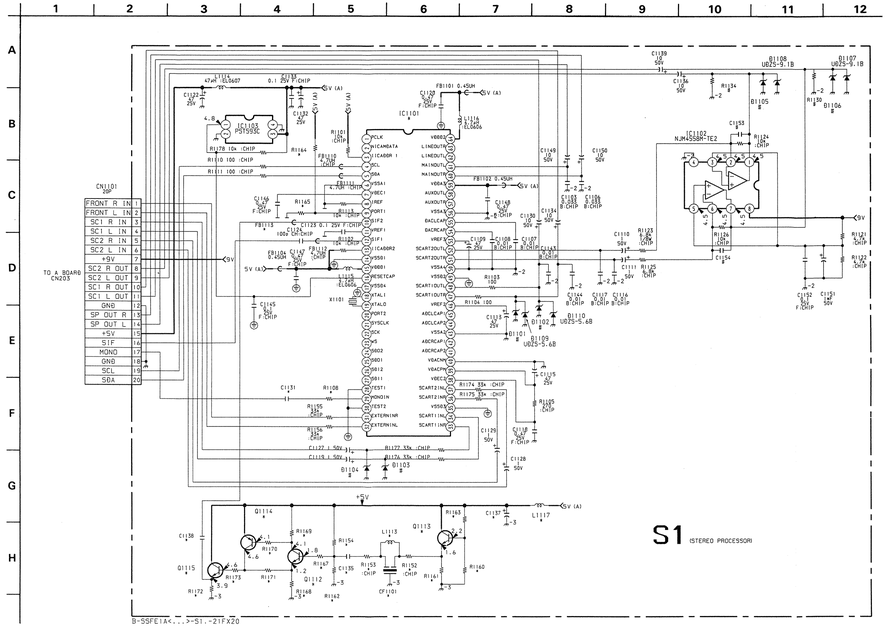
A BOARD *MARK

Ref	21FX20A	21FX20B	21FX20D	21FX20E	21FX20K	21FX20R
C100	-	0.1MF	-	-	-	-
C111	SHORT 0	0.01MF	SHORT 0	SHORT 0	SHORT 0	SHORT 0
C121	-	0.01MF	-	-	-	-
C123	150PF	-	150PF	150PF	180PF	180PF
C124	47MF	-	47MF	47MF	47MF	47MF
C125	47PF	-	47PF	47PF	47PF	47PF
C132	68PF	-	68PF	68PF	47PF	47PF
C133	-	1MF	-	-	-	-
C140	-	47MF	-	-	-	-
C606	220MF 400V	220MF 400V	220MF 400V	220MF 400V	220MF 400V	220MF 450V
CF105	-	TRAP CERAMIC	-	-	-	-
D102	-	BA592-GEG	-	-	-	-
D104	-	DAN202K	-	-	-	-
IC101	TDA9817/V1	TDA9818/V1	TDA9817/V1	TDA9817/V1	TDA9817/V1	TDA9817/V1
JR113	SHORT 0	-	SHORT 0	SHORT 0	SHORT 0	SHORT 0
JR130	-	SHORT 0	-	-	-	-
L105	10UH	-	10UH	10UH	10UH	10UH
L108	-	0.22UH	-	-	-	-
L109	-	0.47UH	-	-	-	-
L117	-	4.7UH	-	-	-	-
L538	COIL	390UH	COIL	COIL	COIL	COIL
Q102	-	2SA1037K-T-146-R	-	-	-	-
Q104	-	DTC144EKA	-	-	-	-
Q107	-	2SC3779C, D-AA	-	-	-	-
Q108	2SC2412K-T-146R	-	2SC2412K-T-146R	2SC2412K-T-146R	2SC2412K-T-146R	2SC2412K-T-146R
Q109	-	DTC144EKA	-		-	-
Q110	-	DTC144EKA	-	-	-	-
Q160	2PD601AR-115	-	2PD601AR-115	2PD601AR-115	2PD601AR-115	2PD601AR-115
R109	-	3.3K	-	-	-	-
R110	-	1.2K	-	-	-	-
R111	-	1.5K	-	-	-	-
R112	-	1.5K	-	-	-	-
R113	-	150	-	-	-	-
R114	SHORT 0	470	SHORT 0	SHORT 0	SHORT 0	SHORT 0
R123	-	330	-	-	-	-
R127	-	180	-	-	-	-
R128	-	4.7K	-	-	-	-
R129	-	3.9K	-	-	-	-
R133	SHORT 0	-	SHORT 0	SHORT 0	SHORT 0	SHORT 0
R137	270	2.2K	270	270	270	270
R138	100K	39K	100K	100K	100K	100K
R139	68K	12K	68K	68K	68K	68K
R140	270	22K	270	270	270	270
R141	560	SHORT 0	560	560	560	560
R142	-	560	-	-	-	-
R147	-	47	-	-	-	-
R148	-	100	-	-	-	-
R149	-	1K	-	-	-	-
R152	-	100	-	-	-	-
R156	-	4.7K	-	-	-	-
R157	-	4.7K	-	-	-	-
R158	-	100	-	-	-	-
R159	3.3K	-	3.3K	3.3K	3.3K	3.3K
R160	1K	SHORT 0	1K	1K	1K	1K
R161	68	SHORT 0	68	68	68	68
RV101	-	22K	-	-	-	-
SWF101	1-767-874-11	1-579-273-11	1-767-874-11	1-767-874-11	1-579-273-11	1-579-273-11
SWF103	-	FILTER, SURFACE WAVE	-	-	-	-
TU101	BTP-AC411	TELE9-001A	BTP-AC411	BTP-AC411	BTP-AC411	BTP-AC411

S1 [STEREO PROCESSOR]

S1 Board

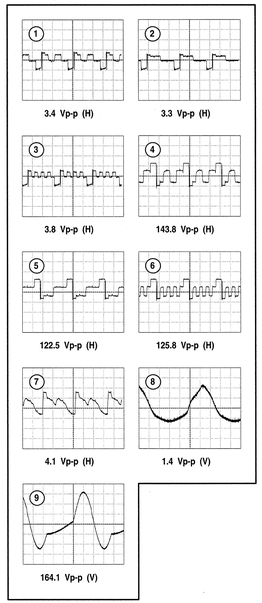




S1 BOARD *MARK

Ref	21FX20A	21FX20B	21FX20D	21FX20E	21FX20K	21FX20R
C1131	-	0.47MF	-	-	-	-
C1135	-	100PF	-	-	-	-
C1137	-	47MF	-	-	-	-
C1138	-	100PF	-	-	-	-
CF1101	-	TRAP CERAMIC 6.5MHZ	-	-	-	-
FB1113	-	4.7UH	-	-	-	-
IC1101	TDA9870A	TDA9875A	TDA9870A	TDA9875A	TDA9875A	TDA9870A
L1113	-	5.6UH	-	-	-	-
L1117	-	47UH	-	-	-	-
Q1112	-	2SC1623-L5L6	-	-	-	-
Q1113	-	2SC1623-L5L6	-	-	-	-
Q1114	-	2SA116G	-	-	-	-
Q1115	-	2SC1623-L5L6	-	-	-	-
R1108	-	15K	-	-	-	-
R1152	-	270	-	-	-	-
R1153	-	100	-	-	-	-
R1154	-	5.6K	-	-	-	-
R1160	-	22K	-	-	-	-
R1161	-	470	-	-	-	-
R1162	-	3.3K	-	-	-	-
R1163	-	22K	-	-	-	-
R1164	-	10K	-	10K	10K	-
R1165	SHORT 0	-	SHORT 0	-	-	SHORT 0
R1167	-	100	-	-	-	-
R1168	-	220	-	-	-	-
R1169	-	1K	-	-	-	-
R1170	-	10	-	-	-	-
R1171	-	680	-	-	-	-
R1172	-	470	-	-	-	-
R1173	-	1K	-	-	-	-

WAVEFORMS CVM BOARD



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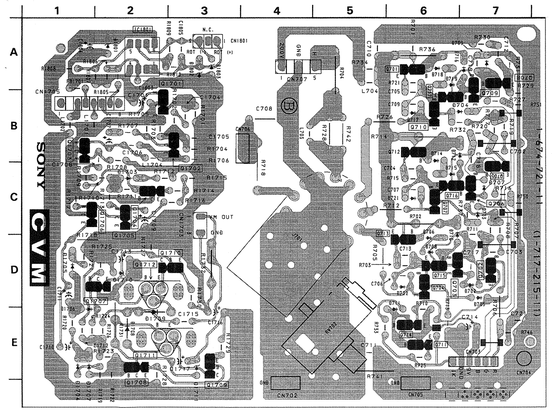
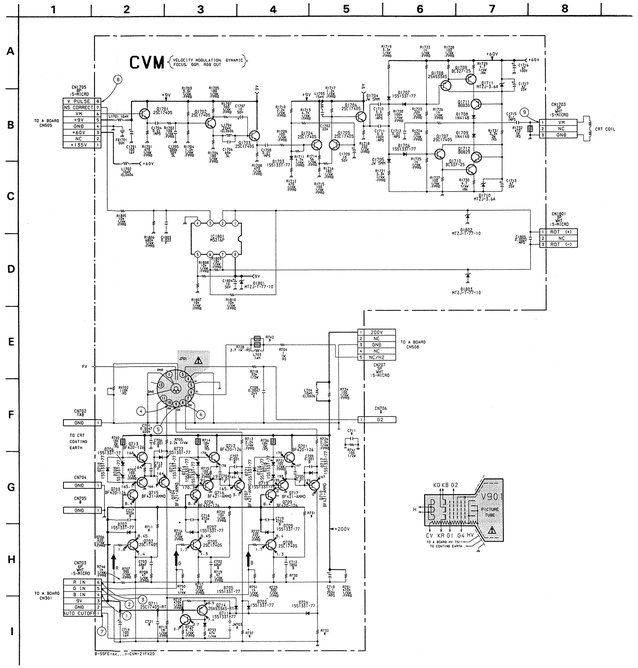
CVM [VELOCITY MODULATION, DYNAMIC FOCUS & R, G, B OUT]





5-4. SEMICONDUCTORS (1)

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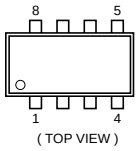
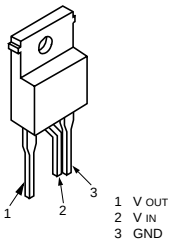
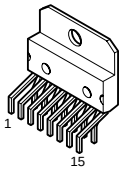
NJM4558M-TE2
NJM2903D



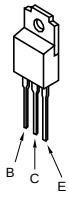
SE-135N
SE135N-LF12



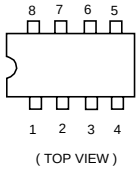
TDA7495



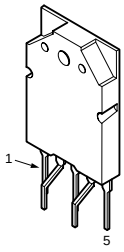
2SC4793



LM393PN
TDA2822M
TEA2124



STR-F6653



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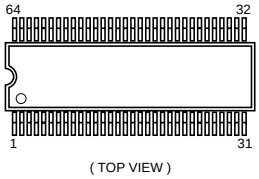
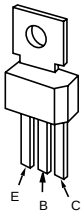
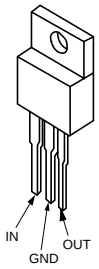
TDA9870



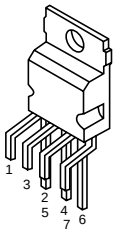
BF871-127



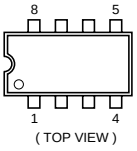
LM294OCT-5.0



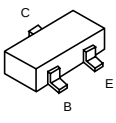
STV9379



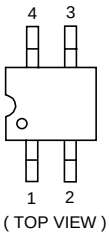
TOP209P



DTA144ESA
DTA144ESA-TP
DTC114EKA
DTC114EKA-T146
DTC143TKA-T146
DTC144EKA-T-146R
2SA1037K-T-146-R
R2SA1162-G
2SA1037K-T-146-QR
2SD601A-QTX
2SC1623-L5-L6
2SC2412K-QR
2SC2412K-T-146-R



PST593C-MMP-4P



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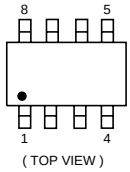

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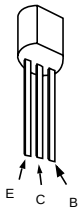
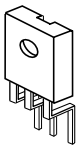
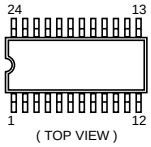
2SA1091-O



SBX1981-51



TDA9818-V1
TDA9817-V1



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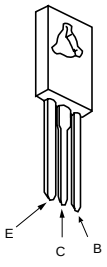

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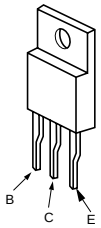

5-4. SEMICONDUCTORS (2)

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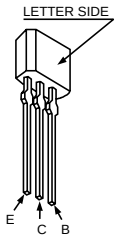
2SAG33ASQT
2SA933AS-RT
2SC1740S-RT



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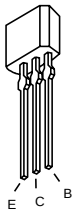
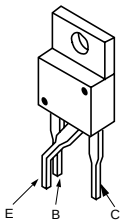
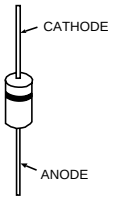


2SK2251-01-F19



AK04-V1
AU-01Z-V1
BYD33G
BYD33G-AMMO
DINL20-TR
ERB44-06TP1
EGP20G
EG-1Z-V1
EL1Z
ERD28-06S
ERD28-08S
ERC06-15SL
FMN-G12S
GP08D
RG1CLF-B1
RGP10GPKG23
RGP15GPKG23
RU-AM
RU3YX-LF-C4
RU3YX-V1
RU-4AM-T3
1N148
1SS292T-77



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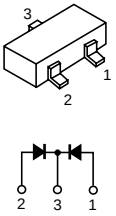
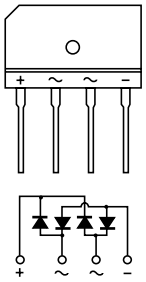
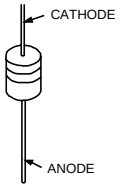
DAN202K-T146



D4SB60L



ERA81-004TP1
ERA83-006
MTZJ-3.6A
MTZJ-T-77-2.2A
HZS9.INBZ
MTZJ-T-77-3.9B
MTZJ-T-77-5.6B
MTZJ-T-77-5.6C
MTZJ-T-77-6.8A
MTZJ-T-77-6.8C
MTZJ-T-77-7.5B
MTZJ-T-77-9.1B
MTZJ-T-77-10
MTZJ-T-77-13B
MTZJ-T-77-33A
MTZJ-33C
MTZJ-7.5B
RD3.9ES-B2
RD5.6ESB2
RD6.8ES-B2
RD7.5ESB2
RD9.1ES-B3
RD10ESB2
RD15ESB2
1SS119-25



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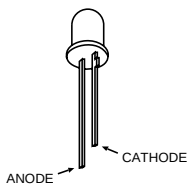
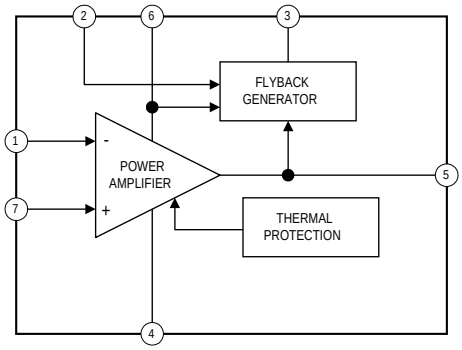
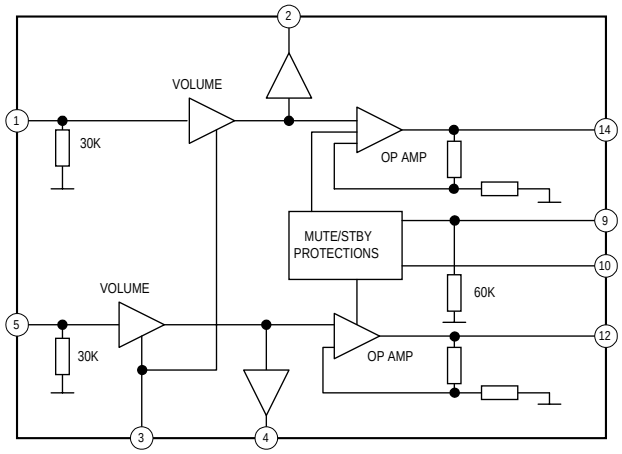


5-5. IC BLOCK DIAGRAMS

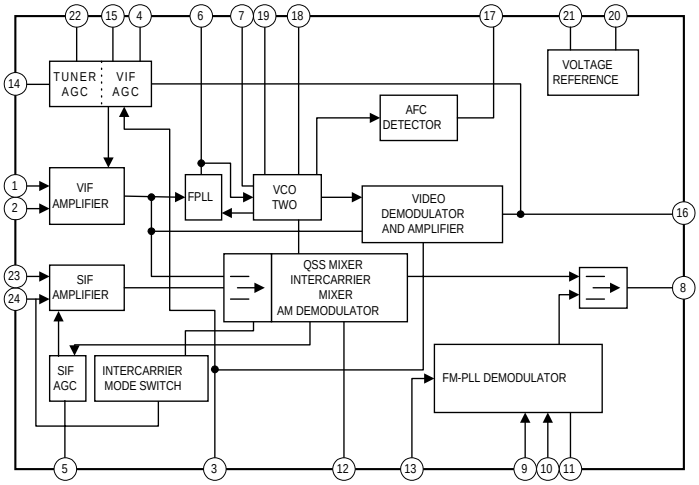
A BOARD IC501 STV 9379



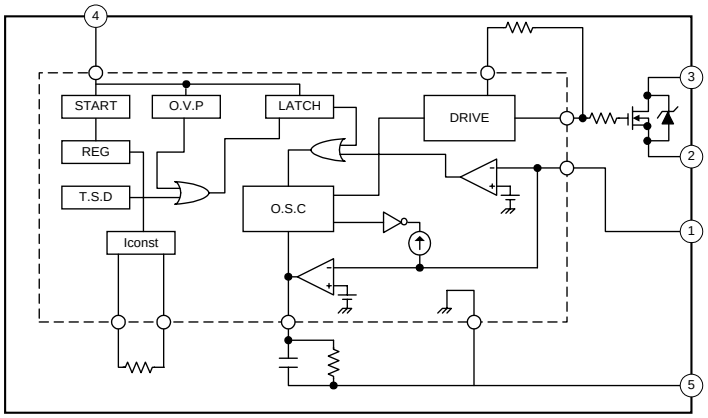
A BOARD IC201 TDA7495



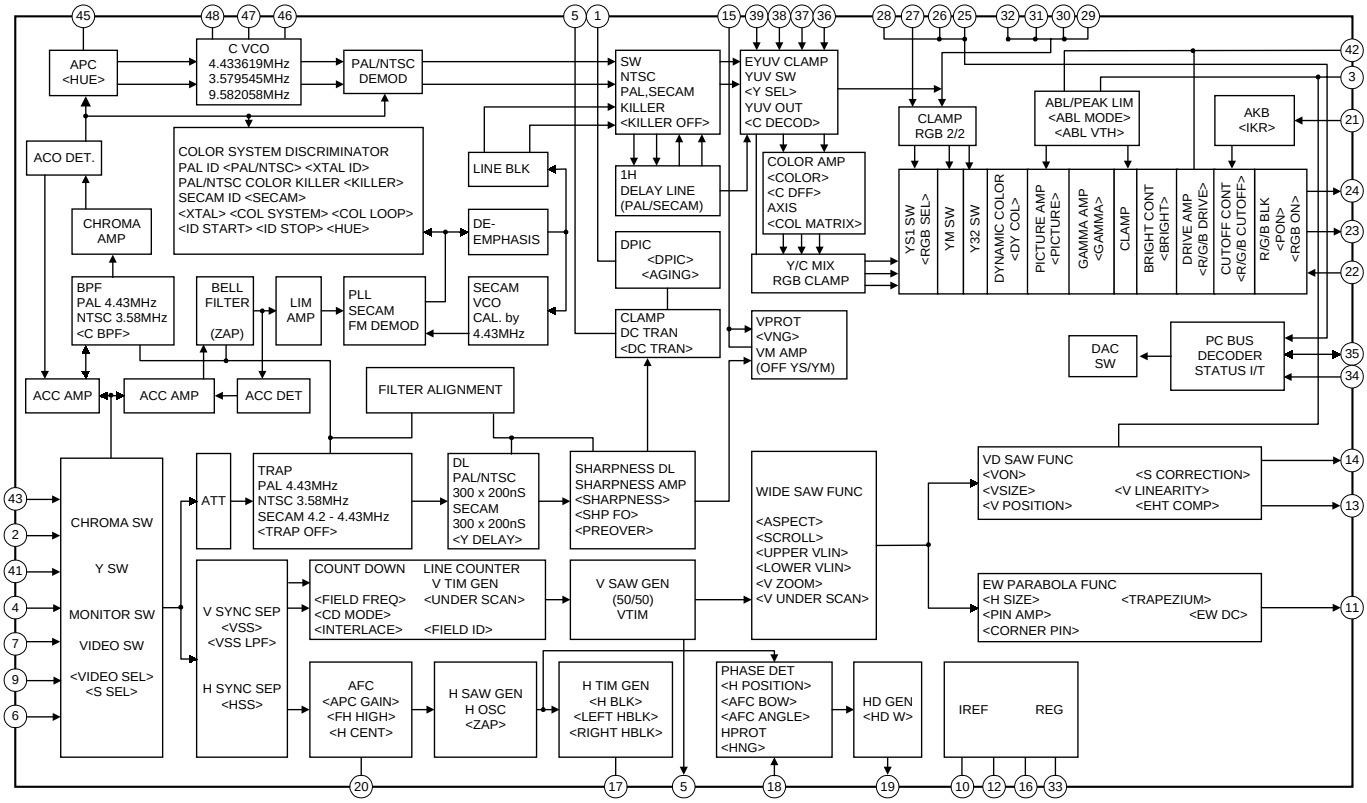
A BOARD IC101 TDA9817/V1



A BOARD IC606 STR-F6653



A BOARD IC301 CXA2140S



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SECTION 6
EXPLODED VIEWS

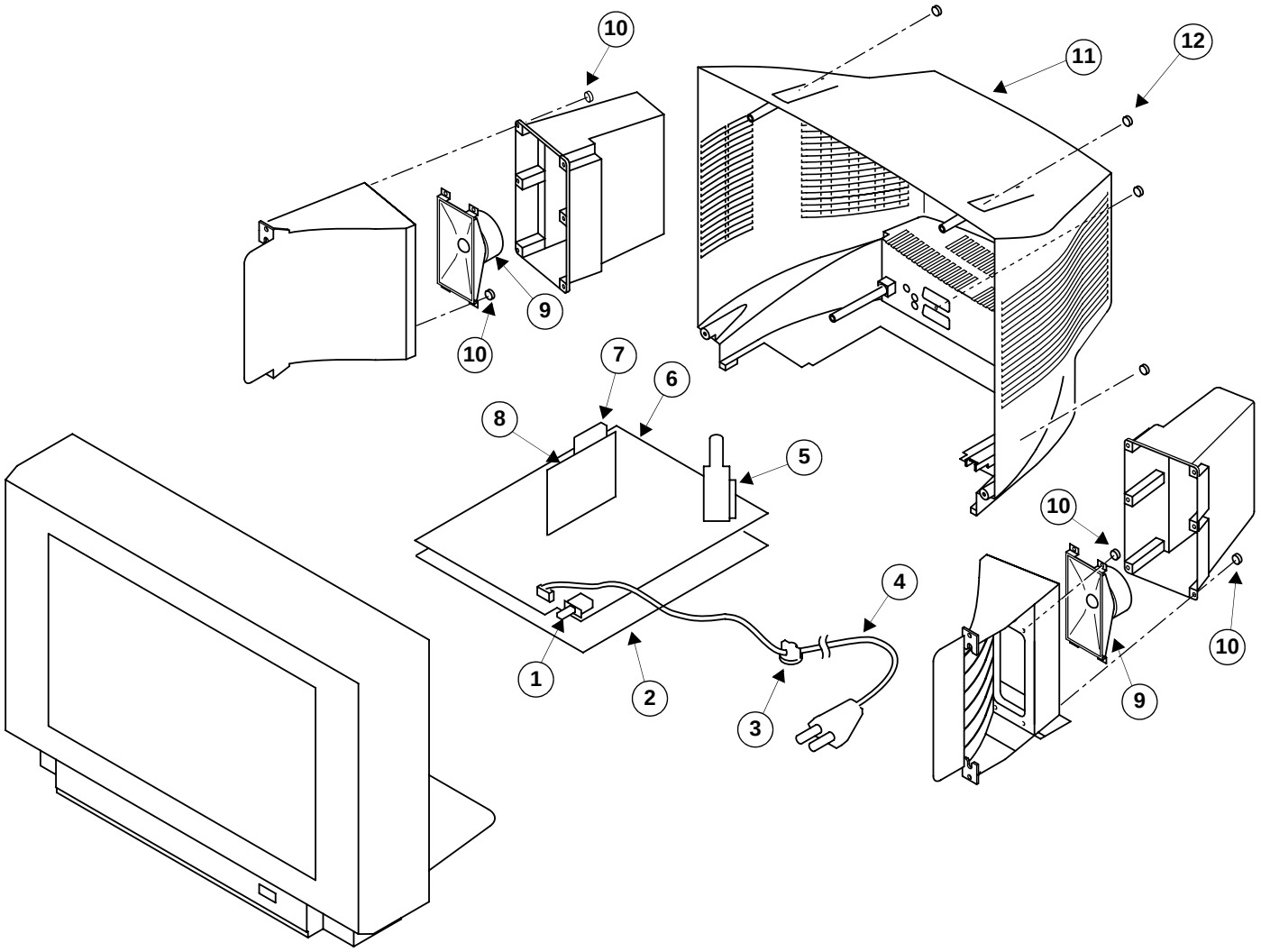
Note : Les composants indentifies par une trame et par une marque ⚠ sonte d'une importance critique pour la securite. Ne les remplacer que par des pieces du numero specifie.

Note : The components identified by shading and marked ⚠ are critical for safety. Replace only with the part numbers specified in the parts list.

NOTE :

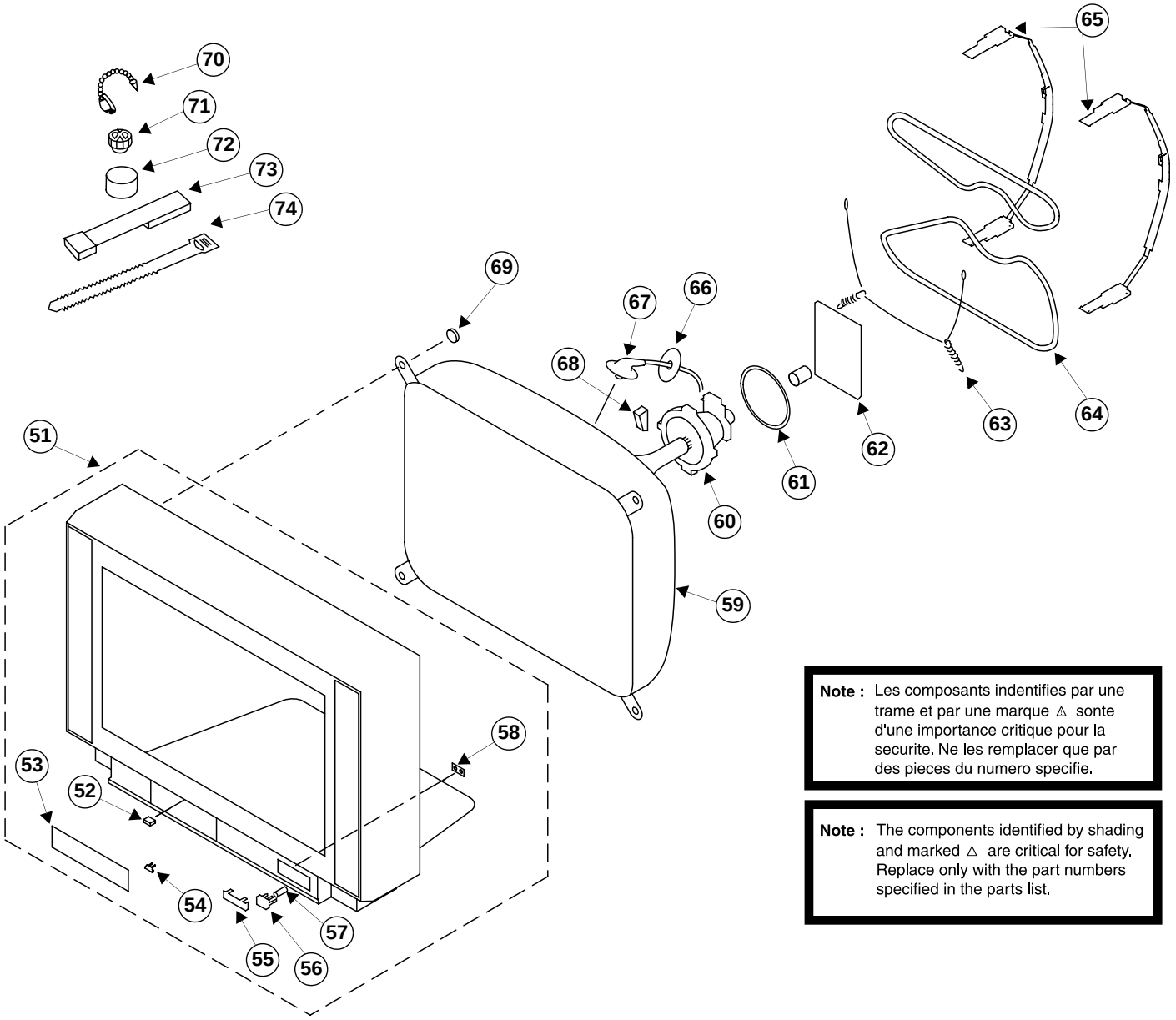
- Items with no part number and no description are not stocked because they are seldom required for routine service.
- The construction parts of an assembled part are indicated with a collation number in the remarks column.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

6-1. CHASSIS



REF. NO.		PART.NO	DESCRIPTION	REMARK
1	⚠	1-571-433-21	SWITCH, PUSH (AC POWER)	
2		*4-204-143-01	BRACKET, MAIN	
3		*4-202-531-01	AC CORD LOCK (SC)	
4	⚠	1-765-286-11	CORD POWER	
5	⚠	1-453-314-21	TRANSFORMER ASSY, FLYBACK	
6		*A-1632-858-A	A BOARD, COMPLETE (KV-21FX20A)	
		*A-1632-855-A	A BOARD, COMPLETE (KV-21FX20B)	
		*A-1632-856-A	A BOARD, COMPLETE (KV-21FX20D)	
		*A-1632-857-A	A BOARD, COMPLETE (KV-21FX20E)	
		*A-1632-860-A	A BOARD, COMPLETE (KV-21FX20K)	
		*A-1632-859-A	A BOARD, COMPLETE (KV-21FX20R)	
7		8-598-432-10	TUNER (BTP-AC411) (KV-21FX20A/21FX20D/21FX20E/ KV-21FX20K/21FX20R)	
		1-693-418-11	TUNER (TELE9-001A) (KV-21FX20B)	
8		*A-1654-041-A	S1 BOARD, COMPLETE (KV-21FX20A/21FX20D/21FX20R)	
		*A-1654-039-A	S1 BOARD, COMPLETE (KV-21FX20B)	
		*A-1654-040-A	S1 BOARD, COMPLETE (KV-21FX20E/21FX20K)	
9		1-505-924-11	SPEAKER (15x6.5CM)	
10		7-685-663-71	SCREW +BVTP 4x16 TYPE2 IT3	
11		4-204-711-01	COVER, REAR	
12		7-685-663-79	SCREW +BVTP 4x16 TYPE 2 IT-3	

6-2. PICTURE TUBE



Note : Les composants indentifies par une trame et par une marque ⚠ sonte d'une importance critique pour la securite. Ne les remplacer que par des pieces du numero specifie.

Note : The components identified by shading and marked ⚠ are critical for safety. Replace only with the part numbers specified in the parts list.

REF. NO.		PART.NO	DESCRIPTION	REMARK
51		X-4200-491-1	BEZNET ASSY	
			(KV-21FX20A/21FX20D/21FX20R) 52-58	
		X-4200-490-1	BEZNET ASSY	
			(KV-21FX20B/21FX20E/21FX20K) 52-58	
52		4-047-464-01	CATCHER, PUSH	
53		4-204-901-11	DOOR, (PAINTED)	
			(KV-21FX20A/21FX20D/21FX20R)	
		4-204-901-01	DOOR, (PAINTED)	
			(KV-21FX20B/21FX20E/21FX20K)	
54		3-703-035-11	SHAFT LID	
55		4-204-902-01	WINDOW, ORNAMENTAL (PRINTED)	
56		4-204-903-01	BUTTON, POWER (PAINTED)	
57		4-204-426-01	SPRING	
58		4-204-706-01	GUIDE LIGHT	
59	£	8-738-809-05	PICTURE TUBE (A51LPT70X) SD-313	
60	£	8-451-494-21	DEFLECTION YOKE (Y21RSA-S)	
61		1-452-728-61	COIL, NA ROTATION (RT-154)	
62		*A-1638-130-A	CVM BOARD, COMPLETE	
63		4-369-318-21	SPRING, TENSION	
64	£	1-419-187-11	COIL, DEGAUSSING	
65		4-204-900-01	BAND, DGC	
66		*4-203-022-01	HOLDER, HV	
67	£	1-251-317-31	CAP ASSY, HIGH VOLTAGE	
68		3-704-495-01	SPACER, DY	
69		4-365-808-01	SCREW (5), TAPPING	
70		4-308-870-00	CLIP, LEAD WIRE	
71		1-452-094-00	MAGNET, ROTATABLE DISK; 15MM Ø	
72		1-452-032-00	MAGNET,DISK; 10MM Ø	
73		X-4387-214-1	PERMALLOY ASSY, CORRECTION	
74		3-701-007-00	BAND, BINDING	

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SECTION 7
ELECTRICAL PARTS LIST

PARTS LISTING TABLE OF CONTENTS

Page

A BOARD COMMON Parts List : Parts common to all models listed in this manual 51

A BOARD VARIANT Parts List : Parts that belong only to the model specified

Model

KV-21FX20A/21FX20D/21FX20E
KV-21FX20K/21FX20R 59

KV-21FX20B 59

CVM BOARD COMPLETE Parts List : 60

S1 BOARD COMMON Parts List : Parts common to all models listed in this manual 62

S1 BOARD VARIANT Parts List : Parts that belong only to the model specified

Model

KV-21FX20A/21FX20D/21FX20E
KV-21FX20K/21FX20R 63

KV-21FX20B 63

MISCELLANEOUS : 64

ACCESSORIES AND PACKAGING MATERIALS : 64

Note : Refer to the designated variant parts list when seeking a part indicated by an asterisk (*)

Parts indicated (#) on the Schematic Diagram are not used in this model and therefore do not appear in the Parts List.

REF. NO.	PART.NO	DESCRIPTION	REMARK

*A-1632-858-A	A Board, Complete	(KV-21FX20A)
*A-1632-855-A	A Board, Complete	(KV-21FX20B)
*A-1632-856-A	A Board, Complete	(KV-21FX20D)
*A-1632-857-A	A Board, Complete	(KV-21FX20E)
*A-1632-860-A	A Board, Complete	(KV-21FX20K)
*A-1632-859-A	A Board, Complete	(KV-21FX20R)

A Board Common Parts

4-382-854-11 SCREW (M3X10), P, SW (+)

< CAPACITOR >

REF. NO.	PART.NO	DESCRIPTION	REMARK
C001	1-104-665-11	ELECT 100MF 20% 25V	
C002	1-115-339-11	CERAMIC CHIP 0.1MF 10% 50V	
C005	1-163-105-00	CERAMIC CHIP 33PF 5% 50V	
C006	1-163-105-00	CERAMIC CHIP 33PF 5% 50V	
C009	1-128-551-11	ELECT 22MF 20% 25V	
C010	1-126-960-11	ELECT 1MF 20% 50V	
C011	1-126-965-11	ELECT 22MF 20% 50V	
C012	1-126-963-11	ELECT 4.7MF 20% 50V	
C013	1-163-017-00	CERAMIC CHIP 0.0047MF 10% 50V	
C014	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C016	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C017	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C018	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C022	1-126-925-11	ELECT 470MF 20% 10V	
C023	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C024	1-104-665-11	ELECT 100MF 20% 10V	
C025	1-104-664-11	ELECT 47MF 20% 10V	
C027	1-104-665-11	ELECT 100MF 20% 10V	
C033	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C035	1-163-021-91	CERAMIC CHIP 0.01MF 10% 50V	
C038	1-126-964-11	ELECT 10MF 20% 50V	
C040	1-163-005-11	CERAMIC CHIP 470PF 10% 50V	
C041	1-163-009-91	CERAMIC CHIP 1000PF 10% 50V	
C050	1-126-925-11	ELECT 470MF 20% 10V	
C051	1-115-339-11	CERAMIC CHIP 0.1MF 10% 50V	
C102	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V	
C103	1-104-665-11	ELECT 100MF 20% 25V	
C105	1-126-965-11	ELECT 22MF 20% 50V	
C107	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V	
C108	1-163-465-11	CERAMIC CHIP 9PF 0.25PF 50V	
C109	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C110	1-163-038-91	CERAMIC CHIP 0.1MF 25V	
C112	1-163-031-11	CERAMIC CHIP 0.01MF 50V	
C115	1-164-489-11	CERAMIC CHIP 0.22MF 10% 16V	
C116	1-126-961-11	ELECT 2.2MF 20% 50V	
C117	1-126-961-11	ELECT 2.2MF 20% 50V	
C118	1-163-038-91	CERAMIC CHIP 0.1MF 25V	
C120	1-163-031-11	CERAMIC CHIP 0.01MF 50V	
C122	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V	
C129	1-104-664-11	ELECT 47MF 20% 16V	
C130	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V	
C134	1-128-551-11	ELECT 22MF 20% 25V	
C135	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C138	1-165-319-11	CERAMIC CHIP 0.1MF 50V	
C139	1-163-031-11	CERAMIC CHIP 0.01MF 50V	
C143	1-104-664-11	ELECT 47MF 20% 25V	
C146	1-163-031-11	CERAMIC CHIP 0.01MF 50V	
C147	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V	
C149	1-126-959-11	ELECT 0.47MF 20% 50V	
C150	1-163-038-91	CERAMIC CHIP 0.1MF 25V	
C151	1-163-017-00	CERAMIC CHIP 0.0047MF 10% 50V	
C152	1-163-017-00	CERAMIC CHIP 0.0047MF 10% 50V	
C160	1-163-017-00	CERAMIC CHIP 0.0047MF 10% 50V	
C201	1-104-666-11	ELECT 220MF 20% 25V	
C202	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V	
C203	1-126-942-61	ELECT 1000MF 20% 25V	
C204	1-126-942-61	ELECT 1000MF 20% 25V	
C205	1-163-033-91	CERAMIC CHIP 0.022MF 50V	
C206	1-126-960-11	ELECT 1MF 20% 50V	
C207	1-126-972-11	ELECT 1000MF 20% 50V	
C209	1-163-033-91	CERAMIC CHIP 0.022MF 50V	
C210	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C211	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C212	1-115-339-11	CERAMIC CHIP 0.1MF 10% 50V	
C213	1-163-019-00	CERAMIC CHIP 0.0068MF 10% 50V	
C214	1-163-019-00	CERAMIC CHIP 0.0068MF 10% 50V	
C215	1-115-339-91	CERAMIC CHIP 0.1MF 10% 50V	
C216	1-115-339-91	CERAMIC CHIP 0.1MF 10% 50V	
C217	1-164-005-91	CERAMIC CHIP 470000PF 10% 25V	
C218	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C219	1-163-009-11	CERAMIC CHIP 0.001MF 10% 50V	
C240	1-163-031-11	CERAMIC CHIP 0.01MF 50V	
C301	1-164-346-11	CERAMIC CHIP 1MF 16V	
C302	1-104-664-11	ELECT 47MF 20% 16V	
C303	1-163-021-91	CERAMIC CHIP 0.01MF 10% 50V	
C304	1-126-964-11	ELECT 10MF 20% 50V	
C306	1-164-161-11	CERAMIC CHIP 0.0022MF 10% 50V	
C308	1-164-004-11	CERAMIC CHIP 0.1MF 10% 25V	
C309	1-164-506-11	CERAMIC CHIP 4.7MF 16V	
C312	1-163-233-11	CERAMIC CHIP 18PF 5% 50V	
C313	1-163-233-11	CERAMIC CHIP 18PF 5% 50V	
C314	1-164-222-11	CERAMIC CHIP 0.22MF 25V	
C316	1-163-259-91	CERAMIC CHIP 220PF 5% 50V	

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A

The components identified by shading and marked ⚠ are critical for safety
Replace only with the part number specified.

REF. NO.	PART.NO	DESCRIPTION			REMARK
C317	1-164-222-11	CERAMIC CHIP	0.22MF		25V
C319	1-126-964-11	ELECT	10MF	20%	50V
C321	1-126-963-11	ELECT	4.7MF	20%	50V
C322	1-164-004-11	CERAMIC CHIP	0.1MF	10%	25V
C328	1-104-664-11	ELECT	47MF	20%	25V
C329	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C330	1-163-038-91	CERAMIC CHIP	0.1MF		25V
C331	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C332	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C333	1-126-960-11	ELECT	1MF	20%	50V
C334	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C335	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C336	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C337	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C338	1-126-967-11	ELECT	47MF	20%	50V
C339	1-164-346-11	CERAMIC CHIP	1MF		16V
C350	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C351	1-163-017-00	CERAMIC CHIP	0.0047MF	10%	50V
C401	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C402	1-126-964-11	ELECT	10MF	20%	50V
C403	1-126-964-11	ELECT	10MF	20%	50V
C405	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C408	1-126-964-11	ELECT	10MF	20%	50V
C409	1-126-960-11	ELECT	1MF	20%	50V
C411	1-126-964-11	ELECT	10MF	20%	50V
C413	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C417	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C426	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C427	1-126-960-11	ELECT	1MF	20%	50V
C428	1-163-009-11	CERAMIC CHIP	0.001MF	10%	50V
C429	1-126-960-11	ELECT	1MF	20%	50V
C430	1-104-664-11	ELECT	47MF	20%	25V
C432	1-163-275-11	CERAMIC CHIP	0.001MF	5%	50V
C433	1-163-275-11	CERAMIC CHIP	0.001MF	5%	50V
C434	1-126-935-11	ELECT	470MF	20%	16V
C501	1-126-968-11	ELECT	100MF	20%	50V
C502	1-163-038-91	CERAMIC CHIP	0.1MF		25V
C503	1-126-968-11	ELECT	100MF	20%	50V
C504	1-106-220-00	MYLAR	0.1MF	10%	100V
C505	1-137-194-81	FILM	0.47MF	5%	50V
C506	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C507	1-126-933-11	ELECT	100MF	20%	16V
C508	1-126-960-11	ELECT	1MF	20%	50V
C509	1-107-364-11	MYLAR	0.01MF	10%	400V
C513	1-107-662-11	ELECT	22MF	20%	250V
C515	1-104-666-11	ELECT	220MF	20%	25V
C517	1-104-666-11	ELECT	220MF	20%	25V
C518	1-106-375-12	MYLAR	0.022MF	10%	250V
C519	1-163-275-11	CERAMIC CHIP	0.001MF	5%	50V
C520	1-163-038-91	CERAMIC CHIP	0.1MF		25V
C522	1-130-495-00	FILM	0.1MF	5%	50V
C531	1-126-964-11	ELECT	10MF	20%	50V
C532	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C535	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C536	1-119-967-11	FILM	0.43MF	5%	250V
C537	1-137-417-11	MYLAR	0.0047MF	10%	200V
C538	1-165-319-11	CERAMIC CHIP	0.1MF		50V
C539	1-109-954-11	ELECT	0.47MF	20%	160V
C540	1-136-206-11	FILM	0.033MF	10%	400V
C541	1-106-383-00	MYLAR	0.047MF	10%	200V
C542	1-162-135-11	CERAMIC	560PF	10%	2KV
C543	1-162-134-11	CERAMIC	470PF	10%	2KV
C545	1-126-960-11	ELECT	1MF	20%	50V
C546	1-129-720-00	FILM	0.033MF	5%	400V
C547	1-115-522-11	FILM	1MF	5%	250V
C548	1-162-134-11	CERAMIC	470PF	10%	2KV
C550	1-107-638-11	ELECT	33MF	20%	160V
C552	1-102-212-00	CERAMIC	820PF	10%	500V
C553	1-106-375-12	MYLAR	0.022MF	5%	100V
C555	1-117-643-31	FILM	1900PF	3%	1.2KV
C571	1-123-024-21	ELECT	33MF		160V
C572	1-104-665-11	ELECT	100MF	20%	10V
C580	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C582	1-163-009-91	CERAMIC CHIP	1000PF	10%	50V
C584	1-126-963-11	ELECT	4.7MF	20%	50V
C601 ⚠	1-107-563-11	FILM	0.1MF	20%	300V
C602 ⚠	1-107-563-11	FILM	0.1MF	20%	300V
C603 ⚠	1-119-888-51	CERAMIC	2200PF	20%	250V
C604 ⚠	1-119-888-51	CERAMIC	2200PF	20%	250V
C605	1-104-665-11	ELECT	100MF	20%	10V
C607	1-161-754-00	CERAMIC	0.001MF	10%	2KV
C609	1-128-550-11	ELECT	2200MF	20%	50V
C610	1-104-665-11	ELECT	100MF	20%	25V
C611	1-165-127-11	CERAMIC	470PF	10%	500V
C612 ⚠	1-161-964-51	CERAMIC	0.0047MF		250V
C613 ⚠	1-161-964-51	CERAMIC	0.0047MF		250V
C614 ⚠	1-161-964-51	CERAMIC	0.0047MF		250V
C615	1-130-202-00	FILM	0.022MF	10%	400V
C618	1-107-890-11	ELECT	2200MF	20%	25V
C621	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
C622 ⚠	1-162-599-12	CERAMIC	0.0047MF		250V
C623	1-107-364-11	MYLAR	0.01MF	10%	400V
C624	1-104-665-11	ELECT	100MF	20%	10V
C625	1-104-665-11	ELECT	100MF	20%	25V

The components identified by shading and marked ⚠ are critical for safety
Replace only with the part number specified.

A

REF. NO.	PART.NO	DESCRIPTION	REMARK
C628	1-124-347-00	ELECT 100MF 20% 160V	
C630	1-165-127-11	CERAMIC 470PF 10% 500V	
C633	1-104-332-11	CERAMIC 470PF 10% 2KV	
C638	1-107-679-41	ELECT 10MF 20% 450V	
C639	1-104-665-11	ELECT 100MF 20% 25V	
C640	1-104-664-11	ELECT 47MF 20% 10V	
C641	1-111-034-11	ELECT 220MF 20% 16V	
C642	1-104-665-11	ELECT 100MF 20% 10V	
C654	1-107-932-11	ELECT 47MF 20% 100V	
		< FILTER >	
CF101	1-404-134-00	TRAP, CERAMIC (5.5MHZ)	
SWF102	1-767-873-11	FILTER, SURFACE WAVE	
		< CONNECTOR >	
CN001	*1-564-508-11	PLUG, CONNECTOR 5P	
CN101	1-695-915-11	TAB (CONTACT)	
CN201	*1-564-507-11	PLUG, CONNECTOR 4P	
CN203	*1-766-957-11	CONNECTOR, BOARD TO BOARD 20P	
CN301	*1-564-509-11	PLUG, CONNECTOR 6P	
CN501	*1-580-798-11	CONNECTOR PIN (DY)	
CN505	*1-564-511-11	PLUG, CONNECTOR 8P	
CN506	1-695-915-11	TAB (CONTACT)	
CN508	*1-564-508-11	PLUG, CONNECTOR 5P	
CN601	£ *1-580-843-11	PIN, CONNECTOR (POWER)	
CN602	£ 1-508-765-00	PIN, CONNECTOR (5MM PITCH) 3P	
CN603	£ *1-508-786-00	PIN, CONNECTOR (5MM PITCH) 2P	
CN608	1-695-915-11	TAB (CONTACT)	
		< DIODE >	
D001	8-719-109-89	DIODE RD5.6ESB2	
D002	8-719-109-89	DIODE RD5.6ESB2	
D003	8-719-030-11	DIODE SLA-570KT3F	
	4-203-258-01	HOLDER, LED (D003)	
D004	8-719-109-89	DIODE RD5.6ESB2	
D005	8-719-109-89	DIODE RD5.6ESB2	
D006	8-719-109-89	DIODE RD5.6ESB2	
D007	8-719-109-89	DIODE RD5.6ESB2	
D008	8-719-991-33	DIODE 1SS133T-77	
D009	8-719-109-89	DIODE RD5.6ESB2	
D010	8-719-109-89	DIODE RD5.6ESB2	
D011	8-719-109-89	DIODE RD5.6ESB2	
D014	8-719-109-89	DIODE RD5.6ESB2	
D015	8-719-914-43	DIODE DAN202K	
D017	8-719-109-89	DIODE RD5.6ESB2	
D018	8-719-991-33	DIODE 1SS133T-77	
D019	8-719-914-43	DIODE DAN202K	
D023	8-719-109-89	DIODE RD5.6ESB2	
D098	8-719-982-96	DIODE MTZJ-T-77-2.2A	
D099	8-719-982-96	DIODE MTZJ-T-77-2.2A	
D101	8-719-982-24	DIODE MTZJ-33A	
D103	8-719-109-89	DIODE RD5.6ESB2	
D106	8-719-982-96	DIODE MTZJ-T-77-2.2A	
D200	8-719-109-89	DIODE RD5.6ESB2	
D201	8-719-929-15	DIODE HZS9.1NB2	
D202	8-719-914-43	DIODE DAN202K	
D204	8-719-109-89	DIODE RD5.6ESB2	
D205	8-719-109-89	DIODE RD5.6ESB2	
D206	8-719-109-89	DIODE RD5.6ESB2	
D207	8-719-914-47	DIODE DAN202K	
D208	8-719-921-20	DIODE 1SS119-25TD	
D209	8-719-921-20	DIODE 1SS119-25TD	
D210	8-719-921-20	DIODE 1SS119-25TD	
D306	8-719-109-89	DIODE RD5.6ESB2	
D307	8-719-109-89	DIODE RD5.6ESB2	
D320	8-719-929-15	DIODE HZS9.1NB2	
D401	8-719-929-15	DIODE HZS9.1NB2	
D402	8-719-421-59	DIODE MA3130WA-TX	
D403	8-719-421-59	DIODE MA3130WA-TX	
D404	8-719-421-59	DIODE MA3130WA-TX	
D405	8-719-109-89	DIODE RD5.6ESB2	
D406	8-719-109-97	DIODE RD6.8ESB2	
D407	8-719-109-97	DIODE RD6.8ESB2	
D408	8-719-929-15	DIODE HZS9.1NB2	
D409	8-719-421-59	DIODE MA3130WA-TX	
D410	8-719-421-59	DIODE MA3130WA-TX	
D411	8-719-421-59	DIODE MA3130WA-TX	
D414	8-719-921-88	DIODE MTZJ-13B	
D416	8-719-421-59	DIODE MA3130WA-TX	
D418	8-719-929-15	DIODE HZS9.1NB2	
D419	8-719-929-15	DIODE HZS9.1NB2	
D420	8-719-109-97	DIODE RD6.8ESB2	
D421	8-719-421-59	DIODE MA3130WA-TX	
D422	8-719-921-88	DIODE MTZJ-13B	
D423	8-719-109-97	DIODE RD6.8ESB2	
D424	8-719-929-15	DIODE HZS9.1NB2	
D425	8-719-929-15	DIODE HZS9.1NB2	
D426	8-719-929-15	DIODE HZS9.1NB2	
D427	8-719-109-97	DIODE RD6.8ESB2	
D428	8-719-109-89	DIODE RD5.6ESB2	
D429	8-719-109-89	DIODE RD5.6ESB2	
D501	8-719-908-03	DIODE GP08D	
D502	8-719-924-13	DIODE MTZJ-T-77-22B	

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REF. NO.	PART.NO	DESCRIPTION	REMARK
D512	8-719-908-03	DIODE GP08D	
D513	8-719-908-03	DIODE GP08D	
D514	8-719-979-85	DIODE EGP20G	
D534	8-719-908-03	DIODE GP08D	
D535	8-719-908-03	DIODE GP08D	
D536	8-719-945-80	DIODE ERC06-15S	
D538	8-719-908-03	DIODE GP08D	
D539	8-719-928-08	DIODE ERD28-08S	
D541	1-535-303-00	LEAD, JUMPER (5.0MM)	
D571	8-719-911-19	DIODE 1SS119-25	
D601	8-719-510-53	DIODE D4SB60L	
D602	8-719-046-74	DIODE AU-01Z-V1	
D603	8-719-046-74	DIODE AU-01Z-V1	
D605	8-719-300-33	DIODE RU-3AM	
D608	8-719-067-88	DIODE RG1CLF-B1	
D610	8-719-067-78	DIODE RN3Z-LF014-302	
D613	8-719-911-19	DIODE 1SS119-25	
D619	8-719-043-76	DIODE AK04V0	
D621	8-719-068-00	DIODE ERC04-06SE	
D626	8-719-068-00	DIODE ERC04-06SE	
D627	8-719-510-26	DIODE DINL20	
D629	8-719-073-23	DIODE ST02D-200TA	
D630	8-719-110-67	DIODE RD27ESB2	
D631	8-719-921-63	DIODE MTZJ-7.5B	
D632	8-719-032-12	DIODE D1NS6	
D633	8-719-109-89	DIODE RD5.6ESB2	
D634	8-719-067-78	DIODE RN3Z-LF014-302	
D654	8-719-302-43	DIODE EL1Z	
		< FUSE >	
F601	⚠ 1-532-504-41	FUSE 4A/250V	
	⚠ *1-533-725-11	HOLDER, FUSE (F601)	
		< FERRITE BEAD >	
FB601	1-412-911-11	FERRITE 0UH	
FB602	1-412-911-11	FERRITE 0UH	
FB603	1-535-303-00	LEAD, JUMPER (5.0MM)	
FB605	1-410-397-21	FERRITE 1.1UH	
FB608	1-412-911-11	FERRITE 0UH	
FB609	1-410-396-41	FERRITE 0.45UH	
FB610	1-410-397-21	FERRITE 1.1UH	
FB611	1-410-397-21	FERRITE 1.1UH	
		< IC >	
IC001	8-759-598-33	IC SAA5564PS/M3A/0008	
IC002	8-742-014-11	HYB IC SBX1981-51	
IC003	8-759-336-46	IC PST574D-T	
IC004	8-759-527-76	IC M24C08-MN6T	
IC201	8-759-442-74	IC TDA7495	
IC301	8-752-091-76	IC CXA2140S	
IC401	8-759-064-91	IC NJM2233BL	
IC501	8-759-192-71	IC STV9379	
IC531	8-759-450-95	IC LM393N	
IC603	8-749-920-61	IC SE-135N	
IC604	8-759-524-82	IC TYA7805CTV	
IC605	8-759-524-83	IC TYA7809CTV	
IC606	8-749-016-17	IC STR-F6653-LF1357	
IC607	8-759-591-02	IC L78L33ABZ-AP	
IC608	8-759-450-47	IC BA05T	
IC609	8-759-468-89	IC TOP209P	
		< SOCKET >	
J201	1-764-606-11	JACK	
J401	*1-766-296-31	CONNECTOR, DUAL SCART	
J402	1-784-967-11	JACK BLOCK, PIN 3P	
J404	1-784-632-11	JACK, PIN 2P	
		< COIL >	
L001	1-535-303-00	LEAD, JUMPER (5.0MM)	
L002	1-408-608-31	INDUCTOR 27UH	
L003	1-408-603-31	INDUCTOR 10UH	
L004	1-408-603-31	INDUCTOR 10UH	
L005	1-408-603-31	INDUCTOR 10UH	
L006	1-408-599-31	INDUCTOR 4.7UH	
L010	1-408-603-31	INDUCTOR 10UH	
L101	1-412-002-31	INDUCTOR CHIP 4.7UH	
L102	1-414-182-11	INDUCTOR 6.8UH	
L103	1-403-686-11	COIL	
L104	1-414-187-11	INDUCTOR 47UH	
L106	1-414-187-11	INDUCTOR 47UH	
L110	1-408-611-31	INDUCTOR 47UH	
L111	1-408-611-31	INDUCTOR 47UH	
L118	1-216-295-91	SHORT 0	
L201	1-414-177-11	INDUCTOR 1UH	
L202	1-414-177-11	INDUCTOR 1UH	
L203	1-406-979-11	INDUCTOR 220UH	
L204	1-414-183-41	INDUCTOR 10UH	
L205	1-414-183-41	INDUCTOR 10UH	
L206	1-408-611-31	INDUCTOR 47UH	
L301	1-410-993-42	INDUCTOR CHIP 1UH	
L302	1-414-187-11	INDUCTOR 47UH	
L303	1-414-186-31	INDUCTOR 33UH	
L305	1-412-002-31	INDUCTOR CHIP 4.7UH	
L324	1-412-002-31	INDUCTOR CHIP 4.7UH	

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REF. NO.	PART.NO	DESCRIPTION	REMARK
L325	1-412-002-31	INDUCTOR CHIP 4.7UH	
L401	1-414-187-11	INDUCTOR 47UH	
L402	1-408-611-31	INDUCTOR 47UH	
L403	1-535-303-00	LEAD, JUMPER (5.0MM)	
L404	1-535-303-00	LEAD, JUMPER (5.0MM)	
L405	1-412-002-31	INDUCTOR CHIP 4.7UH	
L406	1-412-002-31	INDUCTOR CHIP 4.7UH	
L407	1-412-002-31	INDUCTOR CHIP 4.7UH	
L408	1-412-002-31	INDUCTOR CHIP 4.7UH	
L427	1-535-303-00	LEAD, JUMPER (5.00MM)	
L434	1-414-181-11	INDUCTOR 4.7UH	
L435	1-414-181-11	INDUCTOR 4.7UH	
L447	1-410-993-42	INDUCTOR CHIP 1UH	
L501	1-414-187-11	INDUCTOR 47UH	
L502	1-412-531-31	INDUCTOR 33UH	
L503	1-412-521-31	INDUCTOR 4.7UH	
L504	1-535-303-00	LEAD, JUMPER (5.0MM)	
L532	1-412-553-11	INDUCTOR 3.3MMH	
L533	1-406-989-21	INDUCTOR 10MMH	
L535	1-459-111-00	INDUCTOR 10MMH	
L537	1-419-141-11	COIL, HORIZONTAL LINEARITY	
L571	1-412-533-21	INDUCTOR 47UH	
L602	1-408-603-31	INDUCTOR 10UH	
		< PHOTO COUPLER >	
PH601	⚠ 8-749-016-21	IC TCET1103G	
		< TRANSISTOR >	
Q001	1-801-806-11	TRANSISTOR DTC144EKA-T146	
Q010	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q011	1-801-806-11	TRANSISTOR DTC144EKA-T146	
Q012	8-729-422-33	TRANSISTOR 2SD601A-Q-TX	
Q013	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q016	8-729-026-50	TRANSISTOR 2SA1037AK	
Q017	8-729-026-50	TRANSISTOR 2SA1037AK	
Q018	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q019	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q020	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q021	8-729-026-50	TRANSISTOR 2SA1037AK	
Q022	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q101	8-729-026-50	TRANSISTOR 2SA1037AK	
Q111	1-801-806-11	TRANSISTOR DTC144EKA-T146	
Q112	8-729-026-50	TRANSISTOR 2SA1037AK	
Q201	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q202	8-729-422-33	TRANSISTOR 2SD601A-Q-TX	
Q203	8-729-920-75	TRANSISTOR 2SC2412K	
Q204	8-729-920-75	TRANSISTOR 2SC2412K	
Q328	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q329	8-729-026-50	TRANSISTOR 2SA1037AK	
Q405	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q417	8-729-026-50	TRANSISTOR 2SA1037AK	
Q418	8-729-422-33	TRANSISTOR 2SD601A-Q-TX	
Q501	8-729-422-33	TRANSISTOR 2SD601A-Q-TX	
Q532	8-729-038-83	TRANSISTOR 2SK2251-01-F19	
Q533	8-729-049-08	TRANSISTOR BU2515DX-127	
Q535	8-729-119-80	TRANSISTOR 2SC2688-LK	
Q571	8-729-105-08	TRANSISTOR 2SA1330-06	
Q574	8-729-422-33	TRANSISTOR 2SD601A-Q-TX	
Q575	1-801-806-11	TRANSISTOR DTC144EKA-T146	
Q576	8-729-031-00	TRANSISTOR 2PD601AR-115	
Q601	8-729-026-50	TRANSISTOR 2SA1037AK	
		< RESISTOR >	
JR007	1-216-295-91	SHORT 0	
JR023	1-216-296-91	SHORT 0	
JR124	1-216-295-91	SHORT 0	
JR125	1-216-295-91	SHORT 0	
JR132	1-216-295-91	SHORT 0	
JR516	1-216-296-91	SHORT 0	
JR517	1-216-296-91	SHORT 0	
R001	1-216-025-91	RES,CHIP 100 5% 1/10W	
R002	1-216-025-91	RES,CHIP 100 5% 1/10W	
R003	1-216-065-91	RES,CHIP 4.7K 5% 1/10W	
R004	1-216-065-91	RES,CHIP 4.7K 5% 1/10W	
R005	1-216-214-00	RES,CHIP 4.7K 5% 1/8W	
R008	1-216-025-91	RES,CHIP 100 5% 1/10W	
R009	1-216-025-91	RES,CHIP 100 5% 1/10W	
R010	1-216-025-91	RES,CHIP 100 5% 1/10W	
R011	1-216-025-91	RES,CHIP 100 5% 1/10W	
R012	1-247-807-31	CARBON 100 5% 1/4W	
R013	1-216-065-91	RES,CHIP 4.7K 5% 1/10W	
R014	1-216-295-91	SHORT 0	
R015	1-216-045-00	RES,CHIP 680 5% 1/10W	
R016	1-216-055-00	RES,CHIP 1.8K 5% 1/10W	
R017	1-249-429-11	CARBON 10K 5% 1/4W	
R018	1-216-065-91	RES,CHIP 4.7K 5% 1/10W	
R019	1-216-295-91	SHORT 0	
R020	1-216-049-91	RES,CHIP 1K 5% 1/10W	
R021	1-216-065-91	RES,CHIP 4.7K 5% 1/10W	
R022	1-216-049-91	RES,CHIP 1K 5% 1/10W	
R023	1-216-049-91	RES,CHIP 1K 5% 1/10W	
R024	1-216-073-00	RES,CHIP 10K 5% 1/10W	
R025	1-216-073-00	RES,CHIP 10K 5% 1/10W	
R026	1-216-073-00	RES,CHIP 10K 5% 1/10W	

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REF. NO.	PART.NO	DESCRIPTION			REMARK
R027	1-216-083-00	RES,CHIP	27K	5%	1/10W
R028	1-216-049-91	RES,CHIP	1K	5%	1/10W
R029	1-216-073-00	RES,CHIP	10K	5%	1/10W
R030	1-216-073-00	RES,CHIP	10K	5%	1/10W
R031	1-216-073-00	RES,CHIP	10K	5%	1/10W
R032	1-216-089-91	RES,CHIP	47K	5%	1/10W
R033	1-216-093-91	RES,CHIP	68K	5%	1/10W
R034	1-216-049-91	RES,CHIP	1K	5%	1/10W
R035	1-216-198-91	RES,CHIP	1K	5%	1/8W
R036	1-216-049-91	RES,CHIP	1K	5%	1/10W
R037	1-216-081-00	RES,CHIP	22K	5%	1/10W
R038	1-249-429-11	CARBON	10K	5%	1/4W
R039	1-216-065-91	RES,CHIP	4.7K	5%	1/10
R040	1-216-025-91	RES,CHIP	100	5%	1/10W
R046	1-216-081-00	RES,CHIP	22K	5%	1/10W
R047	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R048	1-216-073-00	RES,CHIP	10K	5%	1/10W
R049	1-216-049-91	RES,CHIP	1K	5%	1/10W
R050	1-216-049-91	RES,CHIP	1K	5%	1/10W
R051	1-216-174-00	RES,CHIP	100	5%	1/8W
R052	1-216-295-91	SHORT	0		
R053	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R054	1-216-097-91	RES,CHIP	100K	5%	1/10W
R060	1-216-025-91	RES,CHIP	100	5%	1/10W
R061	1-216-025-91	RES,CHIP	100	5%	1/10W
R062	1-216-182-00	RES,CHIP	220	5%	1/8W
R063	1-216-089-91	RES,CHIP	47K	5%	1/10W
R064	1-216-089-91	RES,CHIP	47K	5%	1/10W
R065	1-216-025-91	RES,CHIP	100	5%	1/10W
R066	1-216-057-00	RES,CHIP	2.2K	5%	1/10W
R067	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R068	1-216-069-00	RES,CHIP	6.8K	5%	1/10W
R069	1-216-041-00	RES,CHIP	470	5%	1/10W
R071	1-216-200-11	RES,CHIP	1.2K	5%	1/8W
R075	1-216-214-00	RES,CHIP	4.7K	5%	1/8W
R077	1-216-082-00	RES,CHIP	24K	5%	1/10W
R082	1-216-013-91	RES,CHIP	33	5%	1/10W
R083	1-216-176-91	RES,CHIP	120	5%	1/8W
R084	1-216-162-91	RES,CHIP	33	5%	1/8W
R085	1-216-176-91	RES,CHIP	120	5%	1/8W
R086	1-216-162-91	RES,CHIP	33	5%	1/8W
R087	1-216-027-91	RES,CHIP	120	5%	1/10W
R088	1-216-214-91	RES,CHIP	4.7K	5%	1/8W
R089	1-216-081-00	RES,CHIP	22K	5%	1/10W
R090	1-216-206-00	RES,CHIP	2.2K	5%	1/8W
R091	1-216-081-00	RES,CHIP	22K	5%	1/10W
R092	1-216-073-00	RES,CHIP	10K	5%	1/10W
R094	1-216-025-91	RES,CHIP	100	5%	1/10W
R095	1-216-025-91	RES,CHIP	100	5%	1/10W
R096	1-247-807-31	CARBON	100	5%	1/4W
R097	1-247-807-31	CARBON	100	5%	1/4W
R098	1-216-097-91	RES,CHIP	100K	5%	1/10W
R099	1-216-246-00	RES,CHIP	100K	5%	1/8W
R101	1-216-049-91	RES,CHIP	1K	5%	1/10W
R103	1-216-041-00	RES,CHIP	470	5%	1/10W
R105	1-216-071-91	RES,CHIP	8.2K	5%	1/10W
R106	1-215-900-11	METAL OXIDE	22K	5%	2W F
R120	1-216-037-00	RES,CHIP	330	5%	1/10W
R121	1-216-025-91	RES,CHIP	100	5%	1/10W
R122	1-216-025-91	RES,CHIP	100	5%	1/10W
R125	1-249-417-11	CARBON	1K	5%	1/4W
R126	1-216-081-00	RES,CHIP	22K	5%	1/10W
R130	1-216-085-00	RES,CHIP	33K	5%	1/10W
R134	1-216-075-00	RES,CHIP	12K	5%	1/10W
R143	1-247-809-91	CARBON	120	5%	1/4W
R144	1-216-222-00	RES,CHIP	10K	5%	1/8W
R145	1-216-212-00	RES,CHIP	3.9K	5%	1/8W
R146	1-216-105-91	RES,CHIP	220K	5%	1/10W
R151	1-216-049-91	RES,CHIP	1K	5%	1/10W
R153	1-216-180-00	RES,CHIP	180	5%	1/8W
R154	1-216-238-91	RES,CHIP	47K	5%	1/8W
R155	1-216-079-00	RES,CHIP	18K	5%	1/10W
R201	1-260-091-11	CARBON	220	5%	1/2W
R202	1-216-113-00	RES,CHIP	470K	5%	1/10W
R203	1-216-081-00	RES,CHIP	22K	5%	1/10W
R204	1-247-863-91	CARBON	22K	5%	1/4W
R205	1-260-091-11	CARBON	220	5%	1/2W
R206	1-216-085-00	RES,CHIP	33K	5%	1/10W
R209	1-216-049-91	RES,CHIP	1K	5%	1/10W
R211	1-215-873-00	METAL OXIDE	4.7K	5%	1W F
R213	1-216-093-91	RES,CHIP	68K	5%	1/10W
R214	1-216-061-91	RES,CHIP	3.3K	5%	1/10W
R215	1-216-061-91	RES,CHIP	3.3K	5%	1/10W
R301	1-216-025-91	RES,CHIP	100	5%	1/10W
R302	1-216-081-91	RES,CHIP	2.2K	5%	1/10W
R303	1-216-073-00	RES,CHIP	10K	5%	1/10W
R304	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R306	1-216-057-00	RES,CHIP	2.2K	5%	1/10W
R307	1-216-041-00	RES,CHIP	470	5%	1/10W
R308	1-216-049-91	RES,CHIP	1K	5%	1/10W
R309	1-216-675-91	METAL CHIP	10K	0.50%	1/10W
R310	1-216-022-00	RES,CHIP	75	5%	1/10W
R312	1-216-061-00	RES,CHIP	3.3K	5%	1/10W
R313	1-247-807-31	CARBON	100	5%	1/4W

REF. NO.	PART.NO	DESCRIPTION			REMARK
R314	1-247-807-31	CARBON	100	5%	1/4W
R315	1-216-075-00	RES,CHIP	12K	5%	1/10W
R316	1-216-025-91	RES,CHIP	100	5%	1/10W
R317	1-216-097-91	RES,CHIP	100K	5%	1/10W
R318	1-412-002-31	INDUCTOR CHIP	4.7UH		
R319	1-412-002-31	INDUCTOR CHIP	4.7UH		
R320	1-412-002-31	INDUCTOR CHIP	4.7UH		
R321	1-216-025-91	RES,CHIP	100	5%	1/10W
R322	1-216-047-91	RES,CHIP	820	5%	1/10W
R323	1-216-025-91	RES,CHIP	100	5%	1/10W
R326	1-216-049-91	RES,CHIP	1K	5%	1/10W
R327	1-216-295-91	SHORT	0		
R328	1-216-049-91	RES,CHIP	1K	5%	1/10W
R329	1-216-031-00	RES,CHIP	180	5%	1/10W
R330	1-216-089-91	RES,CHIP	47K	5%	1/10W
R331	1-216-057-91	RES,CHIP	2.2K	5%	1/10W
R332	1-216-206-00	RES,CHIP	2.2K	5%	1/8W
R333	1-216-206-00	RES,CHIP	2.2K	5%	1/8W
R334	1-216-025-91	RES,CHIP	100	5%	1/10W
R335	1-216-025-91	RES,CHIP	100	5%	1/10W
R336	1-216-077-00	RES,CHIP	15K	5%	1/10W
R338	1-216-049-91	RES,CHIP	1K	5%	1/10W
R339	1-216-081-00	RES,CHIP	22K	5%	1/10W
R340	1-535-143-11	LEAD, JUMPER	(10.0MM)		
R341	1-535-143-11	LEAD, JUMPER	(10.0MM)		
R342	1-216-091-91	RES,CHIP	56K	5%	1/10W
R401	1-216-113-00	RES,CHIP	470K	5%	1/10W
R402	1-216-295-91	SHORT	0		
R403	1-216-041-00	RES,CHIP	470	5%	1/10W
R404	1-216-113-00	RES,CHIP	470K	5%	1/10W
R406	1-216-113-00	RES,CHIP	470K	5%	1/10W
R407	1-216-295-91	SHORT	0		
R408	1-216-022-00	RES,CHIP	75	5%	1/10W
R409	1-216-174-00	RES,CHIP	100	5%	1/8W
R410	1-216-174-00	RES,CHIP	100	5%	1/8W
R411	1-216-022-00	RES,CHIP	75	5%	1/10W
R412	1-216-174-00	RES,CHIP	100	5%	1/8W
R413	1-216-295-91	SHORT	0		
R414	1-216-022-00	RES,CHIP	75	5%	1/10W
R415	1-216-022-00	RES,CHIP	75	5%	1/10W
R416	1-216-022-00	RES,CHIP	75	5%	1/10W
R417	1-249-403-11	CARBON	68	5%	1/4W
R418	1-249-413-11	CARBON	470	5%	1/4W
R419	1-216-022-00	RES,CHIP	75	5%	1/10W
R420	1-216-041-00	RES,CHIP	470	5%	1/10W
R421	1-216-113-00	RES,CHIP	470K	5%	1/10W
R425	1-216-222-91	RES,CHIP	10K	5%	1/8W

REF. NO.	PART.NO	DESCRIPTION			REMARK
R427	1-216-113-00	RES,CHIP	470K	5%	1/10W
R429	1-216-041-00	RES,CHIP	470	5%	1/10W
R430	1-216-113-00	RES,CHIP	470K	5%	1/10W
R431	1-216-022-00	RES,CHIP	75	5%	1/10W
R432	1-216-113-00	RES,CHIP	470K	5%	1/10W
R435	1-216-022-00	RES,CHIP	75	5%	1/10W
R437	1-216-022-00	RES,CHIP	75	5%	1/10W
R439	1-216-041-00	RES,CHIP	470	5%	1/10W
R440	1-216-113-00	RES,CHIP	470K	5%	1/10W
R442	1-216-073-00	RES,CHIP	10K	5%	1/10W
R445	1-216-171-00	RES,CHIP	75	5%	1/8W
R446	1-216-113-00	RES,CHIP	470K	5%	1/10W
R448	1-216-113-00	RES,CHIP	470K	5%	1/10W
R450	1-216-041-00	RES,CHIP	470	5%	1/10W
R454	1-216-041-00	RES,CHIP	470	5%	1/10W
R457	1-216-174-00	RES,CHIP	100	5%	1/8W
R459	1-247-807-31	CARBON	100	5%	1/4W
R460	1-249-403-11	CARBON	68	5%	1/4W
R461	1-216-033-00	RES,CHIP	220	5%	1/10W
R501	1-216-081-00	RES,CHIP	22K	5%	1/10W
R502	1-216-097-91	RES,CHIP	100K	5%	1/10W
R503	1-215-888-00	METAL OXIDE	220	5%	2W F
R504	1-249-385-11	CARBON	2.2	5%	1/4W F
R505	1-216-675-91	METAL CHIP	10K	0.50%	1/10W
R506	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W
R507	1-216-349-00	METAL OXIDE	1	5%	1W F
R508	1-216-675-91	METAL CHIP	10K	0.50%	1/10W
R509	1-216-667-11	METAL CHIP	4.7K	0.50%	1/10W
R510	1-216-081-00	RES,CHIP	22K	5%	1/10W
R512	1-249-382-11	CARBON	1.2	5%	1/4W F
R513	1-216-097-91	RES,CHIP	100K	5%	1/10W
R514	1-249-377-11	CARBON	0.47	5%	1/4W F
R515	1-249-377-11	CARBON	0.47	5%	1/4W F
R516	1-249-493-11	CARBON	56K	5%	1/2W
R517	1-247-869-91	CARBON	39K	5%	1/4W
R518	1-216-661-91	FILM	2.7K	0.50%	1/10W
R520	1-215-884-11	METAL OXIDE	47	5%	2W F
R521	1-216-123-11	RES,CHIP	1.2M	5%	1/10W
R522	1-216-097-91	RES,CHIP	100K	5%	1/10W
R523	1-216-117-00	RES,CHIP	680K	5%	1/10W
R524	1-216-085-00	RES,CHIP	33K	5%	1/10W
R525	1-216-057-00	RES,CHIP	2.2K	5%	1/10W
R526	1-216-089-91	RES,CHIP	47K	5%	1/10W
R527	1-216-079-91	RES,CHIP	18K	5%	1/10W
R528	1-216-073-91	RES,CHIP	10K	5%	1/10W
R529	1-216-073-00	RES,CHIP	10K	5%	1/10W
R530	1-216-085-00	RES,CHIP	33K	5%	1/10W

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The components identified by shading and marked ⚠ are critical for safety
Replace only with the part number specified.

REF. NO.		PART.NO	DESCRIPTION			REMARK
R531		1-216-057-00	RES,CHIP	2.2K	5%	1/10W
R532		1-216-075-91	RES,CHIP	12K	5%	1/10W
R533		1-216-081-00	RES,CHIP	22K	5%	1/10W
R539		1-216-049-91	RES,CHIP	1K	5%	1/10W
R540		1-215-886-11	METAL OXIDE	47	5%	2W F
R541		1-216-105-91	RES,CHIP	220K	5%	1/10W
R542		1-216-089-91	RES,CHIP	47K	5%	1/10W
R543		1-216-089-91	RES,CHIP	47K	5%	1/10W
R546		1-249-401-11	CARBON	47	5%	1/4W F
R547		1-535-303-00	LEAD, JUMPER (5.0MM)			
R548		1-212-849-00	FUSIBLE	4.7	5%	1/4W F
R549		1-216-371-21	METAL OXIDE	1.8	5%	2W F
R551		1-215-873-00	METAL OXIDE	4.7K	5%	1W F
R552		1-216-061-00	RES,CHIP	3.3K	5%	1/10W
R553		1-249-381-11	CARBON	1	5%	1/4W F
R571		1-249-417-11	CARBON	1K	5%	1/4W F
R572		1-216-369-00	METAL OXIDE	1	5%	2W F
R573		1-216-107-91	RES,CHIP	270K	5%	1/10W
R574		1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R575		1-216-097-91	RES,CHIP	100K	5%	1/10W
R581		1-216-089-91	RES,CHIP	47K	5%	1/10W
R582		1-216-089-91	RES,CHIP	47K	5%	1/10W
R583		1-216-081-00	RES,CHIP	22K	5%	1/10W
R588		1-216-051-91	RES,CHIP	1.2K	5%	1/10W
R589		1-216-097-91	RES,CHIP	100K	5%	1/10W
R590		1-216-222-91	RES,CHIP	10K	5%	1/8W
R591		1-215-892-11	METAL OXIDE	1K	5%	2W F
R593		1-249-439-11	CARBON	68K	5%	1/4W
R594		1-216-057-00	RES,CHIP	2.2K	5%	1/10W
R595		1-249-377-11	CARBON	0.47	5%	1/4W F
R602	⚠	1-202-961-11	CEMENTED	1.8	5%	10W
R603		1-202-933-61	FUSIBLE	0.1	10%	1/2W F
R607	⚠	1-202-961-11	CEMENTED	1.8	5%	10W
R608		1-216-488-11	METAL OXIDE	18K	5%	3W F
R611		1-249-415-11	CARBON	680	5%	1/4W
R615		1-249-421-11	CARBON	2.2K	5%	1/4W
R616		1-216-393-00	METAL OXIDE	2.2	5%	3W F
R617		1-249-405-11	CARBON	100	5%	1/4W F
R619		1-216-190-91	RES,CHIP	470	5%	1/8W
R620		1-216-055-00	RES,CHIP	1.8K	5%	1/10W
R622		1-249-401-11	CARBON	47	5%	1/4W
R627		1-249-384-11	CARBON	1.8	5%	1/4W F
R628		1-247-791-91	CARBON	22	5%	1/4W
R632	⚠	1-240-030-91	METAL	4.7M	5%	1/2W
R634	⚠	1-240-030-91	METAL	4.7M	5%	1/2W
R651	⚠	1-220-926-11	FUSIBLE	0.47	10%	1/2W F
R652		1-216-393-00	METAL OXIDE	2.2	5%	3W F
R653		1-216-393-00	METAL OXIDE	2.2	5%	3W F
R654		1-249-389-11	CARBON	4.7	5%	1/4W F
R658		1-215-929-11	METAL OXIDE	100K	5%	3W F
R659		1-216-384-11	METAL OXIDE	0.39	5%	3W F
R660		1-216-384-11	METAL OXIDE	0.39	5%	3W F
R661		1-247-843-11	CARBON	3.3K	5%	1/4W
R662		1-215-929-11	METAL OXIDE	100K	5%	3W F
R665		1-215-902-11	METAL OXIDE	47K	5%	2W F
R666		1-535-143-71	LEAD, JUMPER (7.5MM)			
R667		1-216-488-11	METAL OXIDE	18K	5%	3W F
			< RELAY >			
RY601	⚠	1-755-266-11	RELAY, AC POWER			
			< SWITCH >			
S001		1-571-532-21	SWITCH, TACTIL			
S002		1-571-532-21	SWITCH, TACTIL			
S003		1-571-532-21	SWITCH, TACTIL			
S004		1-571-532-21	SWITCH, TACTIL			
S005		1-571-532-21	SWITCH, TACTIL			
S006		1-571-532-21	SWITCH, TACTIL			
S601	⚠	1-571-433-21	SWITCH, PUSH (AC POWER)			
SW532		1-572-707-11	SWITCH, LEVER			
			< TRANSFORMER >			
T511	⚠	1-453-314-21	TRANSFORMER ASSY, FLYBACK			
T531		1-437-195-11	TRANSFORMER, HORIZONTAL DRIVE			
T601	⚠	1-427-962-11	TRANSFORMER, LINE FILTER			
T602		1-431-732-21	TRANSFORMER, CONVERTER (SRT)			
T603	⚠	1-433-933-11	TRANSFORMER, CONVERTER (SRT)			
			< THERMISTOR >			
THP601	⚠	1-808-059-31	THERMISTOR, POSITIVE			
			< VARISTOR >			
VDR601	⚠	1-801-268-41	VARISTOR TNR14V471K660			
	⚠	*4-374-846-01	COVER, CAPACITOR, CAP TYPE (VDR601)			
			< CRYSTAL >			
X001		1-578-774-11	VIBRATOR, CRYSTAL			
X302		1-567-505-11	OSCILLATOR, CRYSTAL			
X303		1-567-504-11	OSCILLATOR, CRYSTAL			

REF. NO.	PART.NO	DESCRIPTION	REMARK

A Board Variant Parts KV-21FX20A/21FX20D/21FX20E KV-21FX20K/21FX20R

		< CAPACITOR >	
C111	1-216-296-91	SHORT 0	
C123	1-102-108-00	CERAMIC 150PF 10% 50V	
		(KV-21FX20A/21FX20D/21FX20E)	
	1-102-976-00	CERAMIC 180PF 5% 50V	
		(KV-21FX20K/21FX20R)	
C124	1-104-664-11	ELECT 47MF 20% 25V	
C125	1-101-880-00	CERAMIC 47PF 5% 50V	
C132	1-102-525-11	CERAMIC 68PF 5% 50V	
		(KV-21FX20A/21FX20D/21FX20E)	
	1-101-880-00	CERAMIC 47PF 5% 50V	
		(KV-21FX20K/21FX20R)	
C606	1-125-318-00	ELECT(BLOCK) 220MF 20% 400V	
		(KV-21FX20A/21FX20D/21FX20E/21FX20K)	
	1-117-751-11	ELECT(BLOCK) 220MF 20% 450V	
		(KV-21FX20R)	
		< FILTER >	
SWF101	1-767-874-11	FILTER, SURFACE WAVE	
		(KV-21FX20A/21FX20D/21FX20E)	
	1-579-273-11	FILTER, SURFACE WAVE (KV-21FX20K/21FX20R)	
		< IC >	
IC101	8-759-466-49	IC TDA9817/V1	
		< COIL >	
L105	1-408-603-31	INDUCTOR 10UH	
L538	1-419-263-11	COIL, FILTER WITH CORE	
		< TRANSISTOR >	
Q108	8-729-120-28	TRANSISTOR 2SC2412K-146-R	
Q160	8-729-422-33	TRANSISTOR 2PD601AR-115	
		< RESISTOR >	
JR113	1-216-295-91	SHORT 0	
R114	1-216-295-91	SHORT 0	
R133	1-216-295-91	SHORT 0	
R137	1-216-035-00	RES,CHIP 270 5% 1/10W	
R138	1-216-097-91	RES,CHIP 100K 5% 1/10W	
R139	1-216-093-91	RES,CHIP 68K 5% 1/10W	
R140	1-216-035-00	RES,CHIP 270 5% 1/10W	
R141	1-216-043-91	RES,CHIP 560 5% 1/10W	
R159	1-247-843-11	CARBON 3.3K 5% 1/4W	
R160	1-216-049-91	RES,CHIP 1K 5% 1/10W	
R161	1-216-021-00	RES,CHIP 68 5% 1/10W	
		< TUNER >	
TU101	8-598-432-10	TUNER (BTP-AC411)	

A Board Variant Parts KV-21FX20B

		< CAPACITOR >	
C100	1-163-038-91	CERAMIC CHIP 0.1MF 25V	
C111	1-163-059-00	CERAMIC CHIP 0.01MF 50V	
C121	1-163-031-11	CERAMIC CHIP 0.01MF 50V	
C133	1-162-638-11	CERAMIC CHIP 1MF 16V	
C140	1-104-664-11	ELECT 47MF 20% 16V	
C606	1-125-318-00	ELECT(BLOCK) 220MF 20% 400V	
		< FILTER >	
CF105	1-760-154-11	TRAP, CERAMIC	
SWF101	1-579-273-11	FILTER, SURFACE WAVE	
SWF103	1-767-083-11	FILTER, SURFACE WAVE	
		< DIODE >	
D102	8-719-050-59	DIODE BA592-GEG	
D104	8-719-914-43	DIODE DAN202K	
		< IC >	
IC101	8-759-466-47	IC TDA9818/V1	
		< COIL >	
L108	1-410-985-42	INDUCTOR CHIP 0.22UH	
L109	1-410-789-11	INDUCTOR 0.47UH	
L117	1-412-002-42	INDUCTOR CHIP 4.7UH	
L538	1-459-390-00	INDUCTOR 390UH	
		< TRANSISTOR >	
Q102	8-729-920-72	TRANSISTOR 2SA1037K-T-146-QR	
Q104	1-801-806-11	TRANSISTOR DTC144EKA	
Q107	8-729-022-54	TRANSISTOR 2SC3779C,D-AA	
Q109	1-801-806-11	TRANSISTOR DTC144EKA	
Q110	1-801-806-11	TRANSISTOR DTC144EKA	
		< RESISTOR >	
JR130	1-216-296-91	SHORT 0	
R109	1-216-061-00	RES,CHIP 3.3K 5% 1/10W	
R110	1-216-200-11	RES,CHIP 1.2K 5% 1/8W	

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REF. NO.	PART.NO	DESCRIPTION			REMARK
R111	1-216-053-00	RES,CHIP	1.5K	5%	1/10W
R112	1-216-053-00	RES,CHIP	1.5K	5%	1/10W
R113	1-216-029-91	RES,CHIP	150	5%	1/10W
R114	1-216-041-91	RES,CHIP	470	5%	1/10W
R123	1-216-037-00	RES,CHIP	330	5%	1/10W
R127	1-216-031-00	RES,CHIP	180	5%	1/10W
R128	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R129	1-216-063-91	RES,CHIP	3.9K	5%	1/10W
R137	1-216-057-00	RES,CHIP	2.2K	5%	1/10W
R138	1-216-689-11	RES,CHIP	39K	5%	1/10W
R139	1-216-075-00	RES,CHIP	12K	5%	1/10W
R140	1-216-081-91	RES,CHIP	22K	5%	1/10W
R141	1-216-295-91	SHORT	0		
R142	1-216-043-91	RES,CHIP	560	5%	1/10W
R147	1-216-017-91	RES,CHIP	47	5%	1/10W
R148	1-216-174-00	RES,CHIP	100	5%	1/8W
R149	1-216-049-91	RES,CHIP	1K	5%	1/10W
R152	1-216-025-91	RES,CHIP	100	5%	1/10W
R156	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R157	1-216-065-91	RES,CHIP	4.7K	5%	1/10W
R158	1-216-025-91	RES,CHIP	100	5%	1/10W
R160	1-216-295-91	SHORT	0		
R161	1-216-295-91	SHORT	0		
		< VARIABLE RESISTOR >			
RV101	1-241-765-11	RES, ADJ, CARBON 22K			
		< TUNER >			
TU101	1-693-418-11	TUNER (TELE9-001A)			

***A-1638-130-A CVM Board, Complete**

		< CAPACITOR >			
C701	1-137-043-91	FILM	0.0047MF	10%	400V
C702	1-102-525-11	CERAMIC	68PF	5%	50V
C703	1-102-525-11	CERAMIC	68PF	5%	50V
C704	1-101-004-00	CERAMIC	0.01MF		50V
C705	1-101-004-00	CERAMIC	0.01MF		50V
C706	1-102-074-91	CERAMIC	0.001MF	10%	50V
C707	1-102-074-00	CERAMIC	0.001MF	10%	50V
C708	1-162-114-00	CERAMIC	0.0047MF		2KV
C709	1-102-074-00	CERAMIC	0.001MF	10%	50V
C710	1-136-189-00	FILM	0.1MF	10%	250V
C712	1-102-109-00	CERAMIC	180PF	10%	50V
C713	1-101-004-00	CERAMIC	0.01MF		50V
C714	1-104-665-11	ELECT	100MF	20%	16V
C717	1-102-114-00	CERAMIC	470PF	10%	50V
C718	1-102-114-00	CERAMIC	470PF	10%	50V
C719	1-102-114-00	CERAMIC	470PF	10%	50V
C1701	1-104-665-11	ELECT	100MF	20%	16V
C1702	1-102-514-11	CERAMIC	22PF	5%	50V
C1704	1-136-153-00	FILM	0.01MF	5%	50V
C1705	1-102-822-00	CERAMIC	390PF	5%	50V
C1706	1-163-113-00	CERAMIC CHIP	68PF	5%	50V
C1707	1-126-964-11	ELECT	10MF	20%	50V
C1708	1-136-153-00	FILM	0.01MF	5%	50V
C1709	1-126-964-11	ELECT	10MF	20%	50V
C1710	1-107-927-11	ELECT	3.3MF	20%	100V
C1711	1-107-927-11	ELECT	3.3MF	20%	100V
C1712	1-136-153-00	FILM	0.01MF	5%	50V
C1713	1-104-664-11	ELECT	47MF	20%	25V
C1715	1-136-165-00	FILM	0.1MF	5%	50V
C1716	1-107-932-11	ELECT	47MF	20%	100V
C1717	1-104-664-11	ELECT	47MF	20%	25V
C1803	1-101-005-00	CERAMIC	0.022MF		50V
C1804	1-126-964-11	ELECT	10MF	20%	50V
C1805	1-137-366-11	FILM	0.0022MF	5%	50V
		< CONNECTOR >			
CN702	1-695-915-11	TAB (CONTACT)			
CN703	*1-564-509-11	PLUG, CONNECTOR 6P			
CN704	4-352-844-01	PIN, LEAD, COATING			
CN707	*1-564-508-11	PLUG, CONNECTOR 5P			
CN1703	*1-564-506-11	PLUG, CONNECTOR 3P			
CN1705	*1-564-511-11	PLUG, CONNECTOR 8P			
CN1801	*1-564-506-11	PLUG, CONNECTOR 3P			
		< DIODE >			
D702	8-719-991-33	DIODE 1SS133T-77			
D703	8-719-991-33	DIODE 1SS133T-77			
D704	8-719-991-33	DIODE 1SS133T-77			
D705	8-719-991-33	DIODE 1SS133T-77			
D706	8-719-991-33	DIODE 1SS133T-77			
D707	8-719-991-33	DIODE 1SS133T-77			
D708	8-719-991-33	DIODE 1SS133T-77			
D709	8-719-991-33	DIODE 1SS133T-77			
D710	8-719-991-33	DIODE 1SS133T-77			
D711	8-719-991-33	DIODE 1SS133T-77			
D712	8-719-991-33	DIODE 1SS133T-77			
D714	8-719-991-33	DIODE 1SS133T-77			
D715	8-719-991-33	DIODE 1SS133T-77			
D716	8-719-991-33	DIODE 1SS133T-77			
D717	8-719-991-33	DIODE 1SS133T-77			
D718	8-719-991-33	DIODE 1SS133T-77			

The components identified by shading and marked ⚠ are critical for safety
Replace only with the part number specified.

CVM

REF. NO.	PART.NO	DESCRIPTION	REMARK
D719	8-719-991-33	DIODE 1SS133T-77	
D721	8-719-991-33	DIODE 1SS133T-77	
D722	8-719-991-33	DIODE 1SS133T-77	
D1703	8-719-991-33	DIODE 1SS133T-77	
D1704	1-535-303-00	LEAD, JUMPER (5.0MM)	
D1705	1-535-303-00	LEAD, JUMPER (5.0MM)	
D1706	8-719-991-33	DIODE 1SS133T-77	
D1707	8-719-991-33	DIODE 1SS133T-77	
D1708	1-535-143-11	DIODE LEAD, JUMPER (10.0MM)	
D1709	8-719-055-76	DIODE LEAD, JUMPER (10.0MM)	
D1710	8-719-982-03	DIODE MTZJ-3.6A	
D1711	8-719-982-03	DIODE MTZJ-3.6A	
D1801	8-719-110-17	DIODE RD10ESB2	
D1802	8-719-110-17	DIODE RD10ESB2	
D1803	8-719-110-17	DIODE RD10ESB2	
		< FERRITE BEAD >	
FB1701	1-412-911-11	FERRITE 0UH	
		< IC >	
IC1801	8-759-603-37	IC M5216P	
		< JACK >	
J701	⚠ 1-251-595-11	SOCKET, CRT	
		< COIL >	
L703	1-408-591-11	INDUCTOR 1UH	
L704	1-414-183-41	INDUCTOR 10UH	
L1701	1-414-183-41	INDUCTOR 10UH	
L1702	1-414-183-41	INDUCTOR 10UH	
L1703	1-410-665-31	INDUCTOR 15UH	
L1704	1-414-185-41	INDUCTOR 22UH	
		< TRANSISTOR >	
Q701	8-729-046-28	TRANSISTOR BF420-126	
Q702	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q703	8-729-046-28	TRANSISTOR BF420-126	
Q704	8-729-200-17	TRANSISTOR 2SA1091-O	
Q705	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q706	8-729-046-28	TRANSISTOR BF420-126	
Q707	8-729-200-17	TRANSISTOR 2SA1091-O	
Q708	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q709	8-729-046-28	TRANSISTOR BF420-126	
Q710	8-729-200-17	TRANSISTOR 2SA1091-O	
Q711	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q712	8-729-046-28	TRANSISTOR BF420-126	
Q713	8-729-046-28	TRANSISTOR BF420-126	
Q714	8-729-026-39	TRANSISTOR 2SA933AS-QT	
Q715	8-729-200-17	TRANSISTOR 2SA1091-O	
Q716	8-729-200-17	TRANSISTOR 2SA1091-O	
Q717	8-729-200-17	TRANSISTOR 2SA1091-O	
Q1701	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1702	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1703	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1704	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1705	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1706	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1707	8-729-119-78	TRANSISTOR 2SC2785-HFE	
Q1708	8-729-026-39	TRANSISTOR 2SA933AS-QT	
Q1709	8-729-049-09	TRANSISTOR BC327-25	
Q1710	8-729-049-10	TRANSISTOR BC337-25	
Q1711	8-729-049-30	TRANSISTOR BD830	
Q1712	8-729-049-29	TRANSISTOR BD829	
		< RESISTOR >	
R701	1-247-895-91	CARBON 470K 5% 1/4W	
R702	1-216-464-11	METAL OXIDE 18K 5% 2W	F
R703	1-249-405-11	CARBON 100 5% 1/4W	F
R704	1-216-349-00	METAL OXIDE 1 5% 1W	F
R705	1-249-931-11	CARBON 2.2K 5% 1/4W	F
R706	1-247-815-91	CARBON 220 5% 1/4W	
R707	1-249-412-11	CARBON 390 5% 1/4W	
R708	1-249-401-11	CARBON 47 5% 1/4W	
R710	1-247-895-91	CARBON 470K 5% 1/4W	
R712	1-249-931-11	CARBON 2.2K 5% 1/4W	F
R713	1-247-903-00	CARBON 1M 5% 1/4W	
R714	1-216-464-11	METAL OXIDE 18K 5% 2W	F
R715	1-249-405-11	CARBON 100 5% 1/4W	F
R716	1-247-815-91	CARBON 220 5% 1/4W	
R717	1-249-412-11	CARBON 390 5% 1/4W	
R718	1-202-814-11	SOLID 33K 10% 1/2W	
R719	1-249-401-11	CARBON 47 5% 1/4W	
R720	1-249-429-11	CARBON 10K 5% 1/4W	
R721	1-249-405-11	CARBON 100 5% 1/4W	F
R725	1-249-425-11	CARBON 4.7K 5% 1/4W	
R726	1-249-931-11	CARBON 2.2K 5% 1/4W	F
R727	1-247-815-91	CARBON 220 5% 1/4W	
R728	1-216-374-00	METAL OXIDE 2.7 5% 2W	F
R729	1-249-412-11	CARBON 390 5% 1/4W	
R733	1-249-437-11	CARBON 47K 5% 1/4W	
R734	1-247-807-31	CARBON 100 5% 1/4W	
R736	1-216-464-11	METAL OXIDE 18K 5% 2W	F
R741	1-202-549-00	SOLID 100 20% 1/2W	

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REF. NO.	PART.NO	DESCRIPTION			REMARK
R746	1-249-417-11	CARBON	1K	5%	1/4W
R750	1-249-417-11	CARBON	1K	5%	1/4W
R751	1-249-417-11	CARBON	1K	5%	1/4W
R1701	1-249-413-11	CARBON	470	5%	1/4W
R1702	1-247-807-31	CARBON	100	5%	1/4W
R1703	1-247-843-11	CARBON	3.3K	5%	1/4W
R1704	1-249-418-11	CARBON	1.2K	5%	1/4W
R1705	1-249-408-11	CARBON	180	5%	1/4W
R1706	1-249-408-11	CARBON	180	5%	1/4W
R1707	1-249-414-11	CARBON	560	5%	1/4W
R1708	1-249-413-11	CARBON	470	5%	1/4W
R1709	1-247-807-31	CARBON	100	5%	1/4W
R1710	1-249-421-11	CARBON	2.2K	5%	1/4W
R1711	1-249-425-11	CARBON	4.7K	5%	1/4W
R1712	1-249-413-11	CARBON	470	5%	1/4W
R1713	1-249-425-11	CARBON	4.7K	5%	1/4W
R1714	1-249-402-11	CARBON	56	5%	1/4W
R1715	1-247-807-31	CARBON	100	5%	1/4W
R1716	1-249-408-11	CARBON	180	5%	1/4W
R1717	1-249-418-11	CARBON	1.2K	5%	1/4W
R1718	1-260-091-11	CARBON	220	5%	1/2W
R1719	1-247-843-11	CARBON	3.3K	5%	1/4W
R1720	1-249-441-11	CARBON	100K	5%	1/4W
R1721	1-247-843-11	CARBON	3.3K	5%	1/4W
R1722	1-249-417-11	CARBON	1K	5%	1/4W
R1723	1-247-863-91	CARBON	22K	5%	1/4W
R1724	1-247-863-91	CARBON	22K	5%	1/4W
R1725	1-249-417-11	CARBON	1K	5%	1/4W
R1726	1-247-831-91	CARBON	1K	5%	1/4W
R1727	1-247-807-31	CARBON	100	5%	1/4W
R1728	1-247-807-31	CARBON	100	5%	1/4W
R1729	1-249-389-11	CARBON	4.7	5%	1/4W
R1730	1-249-389-11	CARBON	4.7	5%	1/4W
R1731	1-215-895-11	METAL OXIDE	3.3K	5%	2W F
R1732	1-215-867-00	METAL OXIDE	470	5%	1W F
R1805	1-249-429-11	CARBON	10K	5%	1/4W
R1806	1-247-899-11	CARBON	680K	5%	1/4W
R1807	1-249-429-11	CARBON	10K	5%	1/4W
R1808	1-249-429-11	CARBON	10K	5%	1/4W
R1809	1-249-429-11	CARBON	10K	5%	1/4W
R1810	1-249-429-11	CARBON	10K	5%	1/4W

< VARIABLE RESISTOR >

RV702	1-241-656-21	RES, ADJ, METAL FILM 110M			

REF. NO.	PART.NO	DESCRIPTION	REMARK
*A-1654-041-A		S1 Board, Complete (KV-21FX20A/21FX20D/21FX20R)	
*A-1654-039-A		S1 Board, Complete (KV-21FX20B)	
*A-1654-040-A		S1 Board, Complete (KV-21FX20E/21FX20K)	

S1 Board Common Parts

< CAPACITOR >

C1103	1-115-185-11	CERAMIC CHIP	0.033MF	10%	50V
C1106	1-115-185-11	CERAMIC CHIP	0.033MF	10%	50V
C1107	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C1108	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C1109	1-104-664-11	ELECT	47MF	20%	25V
C1110	1-126-960-11	ELECT	1MF	20%	50V
C1111	1-126-960-11	ELECT	1MF	20%	50V
C1113	1-104-664-11	ELECT	47MF	20%	25V
C1115	1-104-664-11	ELECT	47MF	20%	25V
C1116	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C1117	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C1118	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C1119	1-126-960-11	ELECT	1MF	20%	50V
C1120	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C1122	1-104-664-11	ELECT	47MF	20%	25V
C1123	1-163-038-91	CERAMIC CHIP	0.1MF		25V
C1124	1-163-251-11	CERAMIC CHIP	100PF	5%	50V
C1127	1-126-960-11	ELECT	1MF	20%	50V
C1128	1-126-960-11	ELECT	1MF	20%	50V
C1129	1-126-960-11	ELECT	1MF	20%	50V
C1130	1-126-964-11	ELECT	10MF	20%	50V
C1132	1-104-664-11	ELECT	47MF	20%	25V
C1133	1-163-038-91	CERAMIC CHIP	0.1MF		25V
C1134	1-126-964-11	ELECT	10MF	20%	50V
C1136	1-126-964-11	ELECT	10MF	20%	50V
C1139	1-126-964-11	ELECT	10MF	20%	50V
C1143	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C1144	1-163-021-91	CERAMIC CHIP	0.01MF	10%	50V
C1145	1-163-038-91	CERAMIC CHIP	0.1MF		25V
C1146	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C1147	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C1148	1-164-005-11	CERAMIC CHIP	0.47MF		25V
C1149	1-126-964-11	ELECT	10MF	20%	50V
C1150	1-126-964-11	ELECT	10MF	20%	50V
C1151	1-126-960-91	ELECT	1MF	20%	50V
C1152	1-163-038-91	CERAMIC CHIP	0.1MF		25V

REF. NO.	PART.NO	DESCRIPTION	REMARK
		< CONNECTOR >	
CN1101	*1-766-954-11	CONNECTOR, BOARD TO BOARD 20P	
		< DIODE >	
D1107	8-719-069-60	DIODE UDZS-TE17-9.1B	
D1108	8-719-069-60	DIODE UDZS-TE17-9.1B	
D1109	8-719-069-55	DIODE UDZS-TE17-5.6B	
D1110	8-719-069-55	DIODE UDZS-TE17-5.6B	
		< FERRITE BEAD >	
FB1101	1-410-396-41	FERRITE 0.45UH	
FB1102	1-410-396-41	FERRITE 0.45UH	
FB1104	1-410-396-41	FERRITE 0.45UH	
FB1110	1-412-002-31	INDUCTOR CHIP 4.7UH	
FB1111	1-412-002-31	INDUCTOR CHIP 4.7UH	
FB1112	1-412-002-31	INDUCTOR CHIP 4.7UH	
		< IC >	
IC1102	8-759-100-96	IC UPC4558G2	
IC1103	8-759-394-57	IC PST593C-MMP-4P	
		< COIL >	
L1114	1-410-671-31	INDUCTOR 47UH	
L1115	1-408-599-31	INDUCTOR 4.7UH	
L1116	1-408-599-31	INDUCTOR 4.7UH	
		< RESISTOR >	
R1101	1-216-073-00	RES,CHIP 10K 5%	1/10W
R1102	1-216-073-00	RES,CHIP 10K 5%	1/10W
R1103	1-216-025-91	RES,CHIP 100 5%	1/10W
R1104	1-216-025-91	RES,CHIP 100 5%	1/10W
R1105	1-216-035-00	RES,CHIP 270 5%	1/10W
R1110	1-216-025-91	RES,CHIP 100 5%	1/10W
R1111	1-216-025-91	RES,CHIP 100 5%	1/10W
R1113	1-216-073-00	RES,CHIP 10K 5%	1/10W
R1121	1-216-065-91	RES,CHIP 4.7K 5%	1/10W
R1122	1-216-065-91	RES,CHIP 4.7K 5%	1/10W
R1123	1-216-218-00	RES,CHIP 6.8K 5%	1/8W
R1124	1-216-073-00	RES,CHIP 10K 5%	1/10W
R1125	1-216-069-00	RES,CHIP 6.8K 5%	1/10W
R1126	1-216-073-00	RES,CHIP 10K 5%	1/10W
R1155	1-216-085-00	RES,CHIP 33K 5%	1/10W
R1156	1-216-085-00	RES,CHIP 33K 5%	1/10W
R1174	1-216-085-00	RES,CHIP 33K 5%	1/10W
R1175	1-216-085-00	RES,CHIP 33K 5%	1/10W
R1176	1-216-085-00	RES,CHIP 33K 5%	1/10W
R1177	1-216-085-00	RES,CHIP 33K 5%	1/10W
R1178	1-216-073-00	RES,CHIP 10K 5%	1/10W
		< CRYSTAL >	
X1101	1-767-813-21	VIBRATOR, CRYSTAL	

S1 Board Variant Parts KV-21FX20A/21FX20D/21FX20E/ KV-21FX20K/21FX20R

		< IC >	
IC1101	8-759-574-74	IC TDA9870A (KV-21FX20A/21FX20D/21FX20R)	
	8-759-574-73	IC TDA9875A (KV-21FX20E/21FX20K)	
		< RESISTOR >	
R1164	1-216-073-00	RES,CHIP 10K 5%	1/10W (KV-21FX20E/21FX20K)
R1165	1-216-295-91	SHORT 0	(KV-21FX20A/21FX20D/21FX20R)

S1 Board Variant Parts KV-21FX20B

		< CAPACITOR >	
C1131	1-164-005-11	CERAMIC CHIP 0.47MF	25V
C1135	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
C1137	1-104-664-11	ELECT 47MF 20%	25V
C1138	1-163-251-11	CERAMIC CHIP 100PF 5%	50V
		< FILTER >	
CF1101	1-409-327-00	TRAP, CERAMIC (6.5MHZ)	
		< FERRITE BEAD >	
FB1113	1-412-002-31	INDUCTOR CHIP 4.7UH	
		< IC >	
IC1101	8-759-574-73	IC TDA9875A	
		< COIL >	
L1113	1-408-600-31	INDUCTOR 5.6UH	
L1117	1-410-671-31	INDUCTOR 47UH	
		< TRANSISTOR >	
Q1112	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q1113	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q1114	8-729-026-49	TRANSISTOR 2SA1037AK	
Q1115	8-729-120-28	TRANSISTOR 2SC1623-L5L6	

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S1

The components identified by shading and marked ⚠ are critical for safety
Replace only with the part number specified.

REF. NO.	PART.NO	DESCRIPTION			REMARK
		< RESISTOR >			
R1108	1-216-077-00	RES,CHIP	15K	5%	1/10W
R1152	1-216-035-00	RES,CHIP	270	5%	1/10W
R1153	1-216-025-91	RES,CHIP	100	5%	1/10W
R1154	1-216-067-00	RES,CHIP	5.6K	5%	1/10W
R1160	1-216-081-00	RES,CHIP	22K	5%	1/10W
R1161	1-216-041-00	RES,CHIP	470	5%	1/10W
R1162	1-216-061-00	RES,CHIP	3.3K	5%	1/10W
R1163	1-216-081-00	RES,CHIP	22K	5%	1/10W
R1164	1-216-073-00	RES,CHIP	10K	5%	1/10W
R1167	1-216-025-91	RES,CHIP	100	5%	1/10W
R1168	1-216-033-00	RES,CHIP	220	5%	1/10W
R1169	1-216-049-91	RES,CHIP	1K	5%	1/10W
R1170	1-216-001-00	RES,CHIP	10	5%	1/10W
R1171	1-216-045-00	RES,CHIP	680	5%	1/10W
R1172	1-216-041-00	RES,CHIP	470	5%	1/10W
R1173	1-216-049-91	RES,CHIP	1K	5%	1/10W

MISCELLANEOUS

⚠	1-419-187-11	COIL, DEGAUSSING
	1-452-032-00	MAGNET, DISC; 10MM
	1-452-094-00	MAGNET, ROTATABLE DISK; 15MM
	1-452-728-61	COIL, NA ROTATION (RT-154)
⚠	1-453-314-21	TRANSFORMER ASSY, FLYBACK
	1-505-924-11	SPEAKER (15x6.5CM)
⚠	1-251-317-31	CAP ASSY, HIGH-VOLTAGE
⚠	1-571-433-21	SWITCH, PUSH (AC POWER)
⚠	1-765-286-11	CORD, POWER
	8-598-432-10	TUNER (BTP-AC411) (KV-21FX20A/21FX20D/21FX20E/21FX20K/21FX20R)
	1-693-418-11	TUNER (TELE9-001A) (KV-21FX20B)
⚠	8-738-809-05	PICTURE TUBE (A51LPT70X) SD-313
⚠	8-451-494-21	DEFLECTION YOKE (Y21RSA-S)

ACCESSORIES AND PACKAGING MATERIALS

*4-042-477-01	BAG, PROTECTION
*4-204-898-01	INDIVIDUAL CARTON
*4-204-892-01	CUSHION (UPPER) (ASSY)
*4-204-895-01	CUSHION (LOWER) (ASSY)
4-204-905-41	MANUAL INSTRUCTION (KV-21FX20A) (ITALIAN)
4-204-905-51	MANUAL INSTRUCTION (KV-21FX20B) (FRENCH/ITALIAN/GERMAN/DUTCH)
4-204-905-11	MANUAL INSTRUCTION (KV-21FX20D) (ENGLISH/GERMAN/GREEK/TURKISH)
4-204-905-71	MANUAL INSTRUCTION (KV-21FX20E) (SPANISH)
4-204-905-81	MANUAL INSTRUCTION (KV-21FX20E) (FINNISH/NORWEGIAN/PORTUGUESE/DANISH/ SWEDISH)
4-204-905-91	MANUAL INSTRUCTION (KV-21FX20K) (ENGLISH/POLISH/HUNGARIAN)
4-204-906-91	MANUAL INSTRUCTION (KV-21FX20R) (ENGLISH/RUSSIAN/BULGARIAN)

REMOTE COMMANDER

1-418-476-11	REMOTE COMMANDER (RM-887)

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